

Why Europe's data centers are preparing for new energy efficiency reporting

Turning regulations into business opportunities

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Schneider
Electric

Introduction

About this e-book

The purpose of this e-book is to inform on the imminent arrival of the European Commission's Energy Efficiency Directive (EED). This directive may have implications for you or your data center organization.

This e-book explains what the EED is, what may be required of you, and how Schneider Electric is committed to helping data center owners and operators with the management and reporting of their sustainability data.



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What is the EED?



Introducing the Energy Efficiency Directive (EED)

From September 2024, owners and operators of data centers within the European Union (EU) – may, depending on the size of their data centers - have a legal obligation to report their data centers' annual energy performance into a European database. This mandate comes from a recently introduced EU policy, known as the [Energy Efficiency Directive](#) (EED).

The EED is a comprehensive legislative framework aimed at reducing energy consumption and promoting energy efficiency across various sectors. First published by the European Commission in 2012, and part of the [European Green Deal](#), the EED directive sets rules and obligations for companies, to ensure they achieve strict energy efficiency targets across the EU.

The EED was most recently updated in 2023, and this latest update, known as the 'recast EED', has established 'energy efficiency first' as a fundamental principle of EU energy policy,

giving it legal standing for the first time.

Article 12 of the new EED update demands that data centers make information about their energy performance publicly available. These reporting requirements apply to all data centers, old and new, whose IT installed power demand is above a certain threshold, which is specified later in this e-book.

This latest EED update includes new obligations that specifically relate to data centers operating in Europe – and this includes non-EU data center companies who are operating within the EU.

Finally, the reason data centers are being officially required to report into this directive is because they contribute significantly to energy consumption within Europe, and their consumption levels are set to rise. It's not surprising then that this latest version of the EED calls out the data center industry extensively.

Why do we need the EED?

Europe – a region that's data center dependent

Across Europe, our reliance on the IT infrastructure is greater than ever. In fact, data centers now have the fastest growing energy consumption and carbon footprint across the whole ICT sector. This is largely a result of technological advances such as cloud computing and the rapid growth in use of internet services.

And the figures back this up:

2.7%

of European electricity usage is consumed by Data Centres today, it is expected to reach 3.21% by 2030.
Publications Office of the EU

7%

of global electricity usage is consumed by the ICT industry
Publications Office of the EU

28.2%

is the expected growth in EU data center energy consumption up until 2030
Publications Office of the EU

43%

of executives are aware of their organization's IT footprint
Capgemini

80%

of CIOs will have performance metrics tied to the sustainability of their IT organization by 2027
Gartner

1,255

is the number of ESG regulations introduced worldwide since 2011, representing an increase of 155%
ESG Book



Given these statistics, it's no surprise that the data center industry is under pressure to rethink how it pursues sustainable, energy-efficient practices. This pressure is coming, not only from formal government regulations like the EED, but also from robust [Environmental, Social, and Governance \(ESG\) programs](#) that data center owners and operators are now implementing internally, as nations across Europe strive to curb data center energy consumption and emissions.

The media spotlight is on data center energy demand

Data center regulation is regularly covered by the international media

For a long time now, the international press has been talking about the urgency of formal sustainability related regulations, driven by massive growth in the data center industry.

[Rising Data Center Costs Linked to AI Demands](#)

Energy usage associated with running AI number-crunching is fast becoming a key driver of rising data center bills.

July 2023

[A wake-up call: the EU Efficiency Directive reporting will affect you](#)

The European Commission's EED reporting requirements will have far-reaching implications for the data center industry.

April 2023

[For Data Centers, Sustainability Matters More Than Ever In The Age Of AI](#)

For data center providers—which provide the digital backbone for AI and the rest of today's economy—it's an exciting time. But let's not kid ourselves. AI chips come with a big environmental price tag, thanks to their prodigious thirst for power and water.

April 2024

[As the AI industry booms, what toll will it take on the environment?](#)

AI programs can seem incorporeal. But they are powered by networks of servers in data centers around the world, which require large amounts of energy to power and large volumes of water to keep cool.

June 2023

THE WALL STREET JOURNAL.



Forbes

The Guardian

And this energy demand is set to grow

AI is fueling data center energy needs

According to market intelligence firm IDC, the acceleration of generative artificial intelligence is fueling a steep climb in data center energy consumption, anticipating **a growth from 320TWh in 2022 to 887TWh by 2027**, at a compound annual growth rate of 22.6%.

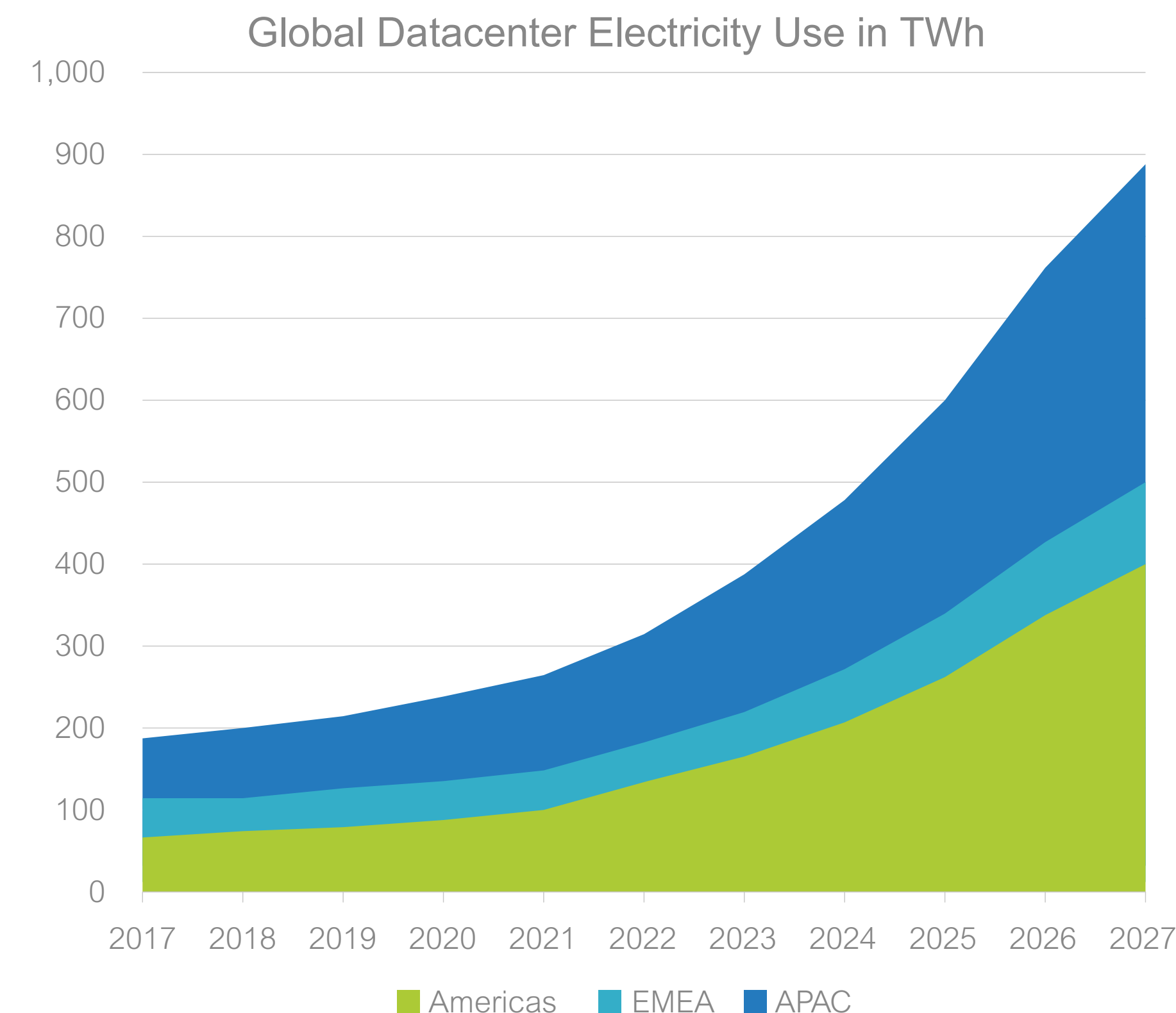
This growth represents the total energy consumption used by the country of France for the whole of 2022.

Given this trend, it's hardly surprising that the data center industry in Europe is now having to adhere to strict government sustainability directives like the EED.

Data centers are voracious energy consumers, accounting for nearly 2.7% of European electricity usage it is expected to reach 3.21% by 2030. ([EU Commission](#))

The aim is to reduce energy consumption and carbon emissions across the bloc. One way it targets this goal is by setting requirements specifically for data centers.

The EU's focus on data centres in the EED reflects a multi-pronged approach: tackling climate change, bolstering energy security, and promoting economic benefits for the data center industry itself.



A closer look at the EED

What are the specifics of the EED directive?

Here are some of the key provisions, as set out in the new directive:

- 1. Mandatory Reporting:** Data center operators with a total rated power of at least 500 kilowatts (kW) are required to publicly report their energy performance data annually. This data includes energy consumption, PUE (Power Usage Effectiveness), temperature set points, waste heat utilization, water usage, and use of renewable energy.
- 2. Waste Heat Utilization:** Data centers with a total rated power exceeding 1 MW must utilize their waste heat for heating purposes or other energy recovery applications unless it is technically or economically unfeasible. This promotes the circular economy and reduces the need for fossil fuels.
- 3. Renewable Energy Integration:** Data centers should prioritize the use of renewable energy sources for their electricity consumption. This effort helps to reduce the carbon footprint of data centers and contribute to a more sustainable energy mix.
- 4. Optimizing Energy Consumption:** Data center operators must implement energy efficiency measures to reduce their overall energy consumption. This includes optimizing cooling systems, using more efficient IT equipment, and adopting virtualization and server consolidation techniques.

For more on the EED directive

Visit the official EU EED homepage: https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficiency-targets-directive-and-rules/energy-efficiency-directive_en

...where you can find the full report: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJOL_2023_231_R_0001&qid=1695186598766

The data you will need to report on

Here are the 25 key EED data points you need to know:

The current EED directive lists the 25 key data center sustainability data points that data center owners and operators will have to report on.

Information on the reporting data centre

Data centre name

Owner and operator of the data centre

Location of the data centre

Type of data centre (enterprise, colocation, co-hosting)

Operator shall report on

Energy and sustainability indicators

Installation information technology power demand (PDIT in kW)

Data centre total floor area (SDC in sqm)

Total energy consumption (EDC in kWh)

Total energy consumption of information technology equipment (EIT in kWh)

Electrical grid functions

Average battery capacity (CBTG in kW)

Total water input (WIN in cubic meters) or WUE

Total potable water input WIN-POT

Waste heat reused EREUSE

Average waste heat temperature (TWH in Celsius)

Average setpoint information technologie equipment intake air temperature (TIN in Celsius)

Type of refrigerants

Cooling degree days (CDD)

Total renewable energy consumption (ERES-TOT in kWh)

Total renewable energy consumption from Guarantees of Origin (ERES-GOO in kWh)

Total renewable energy consumption from Power Purchasing Agreements (ERES-PAA in kWh)

Total renewable energy consumption from on-site renewables (ERES-OS in kWh)

ICT capacity indicators

ICT capacity for servers (CSERV)

ICT capacity for storage equipment (CSTOR in petabytes)

Data traffic indicators

Incoming traffic bandwidth (BIN)

Outgoing traffic bandwidth (BOUT)

Incoming data traffic (TIN)

Outgoing data traffic (TOUT)

Countdown to EED day

The 'who-what-when' of the EED directive

Here's a simplified overview of the EED directive:

Who is affected by the EED?

Owners and operators of data centers above 500 kW of installed information technology power demand (~250 kW of IT capacity) or an annual energy use of over 2780 MWh.

What data must be submitted to the EED?

This includes floor area, installed power, data volumes, energy consumption, PUE, temperature set points, waste heat utilization, water usage, and use of renewable energy.

The exact requirements are set out in [Annex VII](#) of the EED directive.

When is the EED timeline?

From **15 September 2024**, data center owners and operators within the European Union have a legal obligation to report their data center's energy performance for the previous year, annually, into a European database.

Today's reporting reality

While the EED initiative is undoubtedly the way forward in terms of promoting a sustainable data center industry, a key question is, how do we go about capturing and managing so much data center sustainability data - especially when most data center companies have their sustainability data spread across the organization, making it difficult to measure, monitor and report on.

To help data center owners and operators with their sustainability data management and reporting, Schneider Electric has developed a suite of software tools that monitor, measure, manage, and control data center utilization and energy consumption of the physical infrastructure components within the data center environment. This solution is exactly what the data center industry requires, especially now that the 'EED clock' is ticking towards September 2024.

47%

of the large companies surveyed still use spreadsheets to manage their ESG data ([Sustainability Magazine](#))

56%

of respondents anticipate IT will be required to support corporate sustainability mandates ([SustainableIT.org](#))

DCIM - your essential tool for sustainability reporting

What is DCIM?

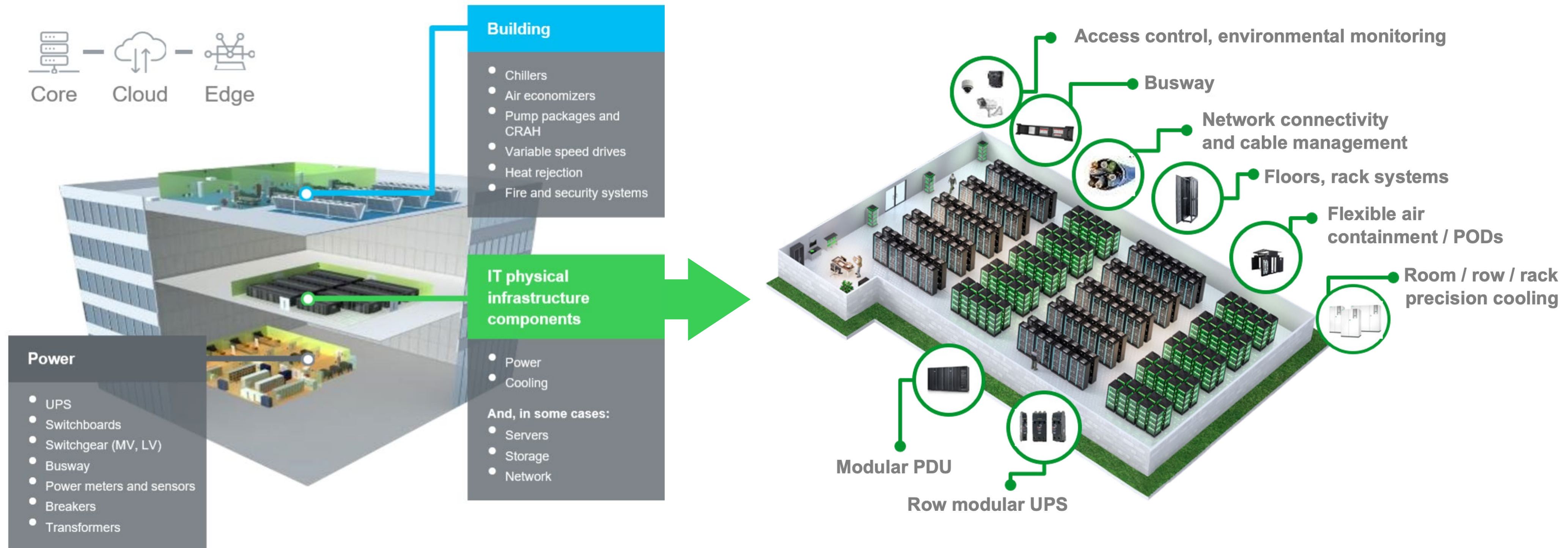
Schneider Electric's DCIM (also known as EcoStruxure™ IT Data Center Infrastructure Management), is a portfolio of software tools that enable data center owners and operators to track, measure and report on their energy and sustainability reporting. This makes it an indispensable tool for directives such as the EED.

Investing in a DCIM tool and ensuring updates are made to your existing tools can both improve the performance capabilities of your infrastructure, and the visibility of the metrics on which you are reporting. For metrics to be meaningful, it is important for the DCIM tool to aggregate all the data it can communicate with and normalize data from all data sources. DCIM can aggregate and report PUE, as well as total energy consumption, with breakdowns by subsystems and even carbon emissions.

At Schneider Electric we are committed to investing in our DCIM tool, to support our customers with their sustainability data reporting. We've created a function for 'click of the button' reporting into a simple easy to use format. DCIM 3.0 is our latest version of this tool and includes new features to visualize the metrics in DCIM. What's more, this tool makes it easy to track data and visualize historical changes, and if needed, download weekly, monthly, or yearly reports.

Our customers can depend on us to continue to drive the evolution of DCIM, knowing that we are ideally positioned to support them when it comes to managing and measuring their energy-related data – so that their data reporting to the EED and other similar future directives is a smooth process.

DCIM - your essential tool for sustainability reporting



EED regulations reporting made easy

Introducing new model-based, automated sustainability metric reporting

- ▶ Automated model and data-based PUE reporting
- ▶ Easily view trending over time for various data centers
- ▶ Export data to enable manipulation in other tools
- ▶ Access this data from your preferred tool

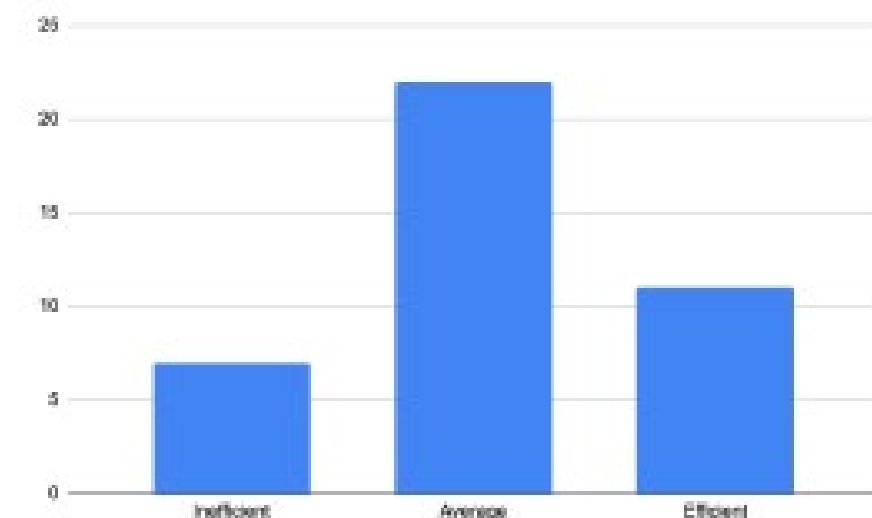
Sustainability Report

Sustainability metrics informed by your sensors and devices. Click into each item for a detailed graphical view of your scores over time, and improve the accuracy of your scores by editing and providing more information.

Overview

40 out of 50 rooms have a PUE calculated

- 11 rooms have a PUE at or below 1.6
This is considered **Efficient**. It equals a DCIE at or above 62.5%.
- 22 rooms have a PUE between 1.6 and 2.6
This is considered **Average**. It equals a DCIE between 62.5% and 38.5%.
- 7 rooms have a PUE above 2.6
This is considered **Inefficient**. It equals a DCIE below 38.5%.

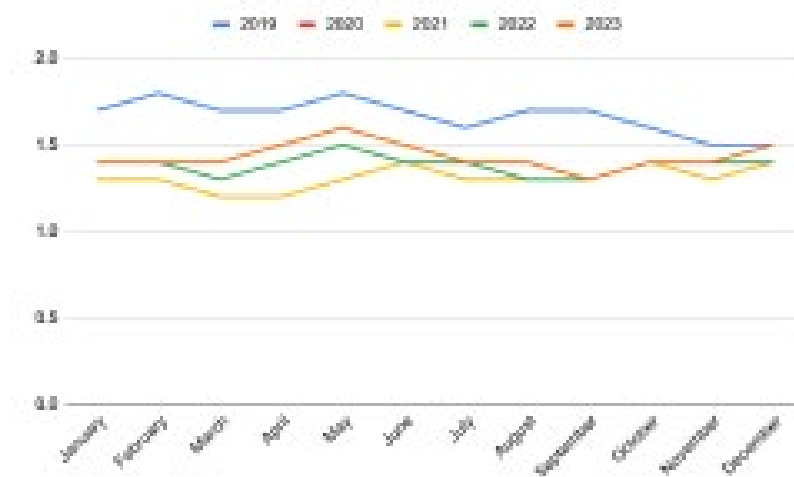


Category	Count
Inefficient	7
Average	22
Efficient	11

Room Details

Past 30 days: -0.40

Room 1
NAM > Andover > Disco Lab



1.6
±0.50
PUE

1.6 1.5 1.4 1.5 1.4
2019 2020 2021 2022 2023

62.5%
DCIE

62 kWh
Cooling

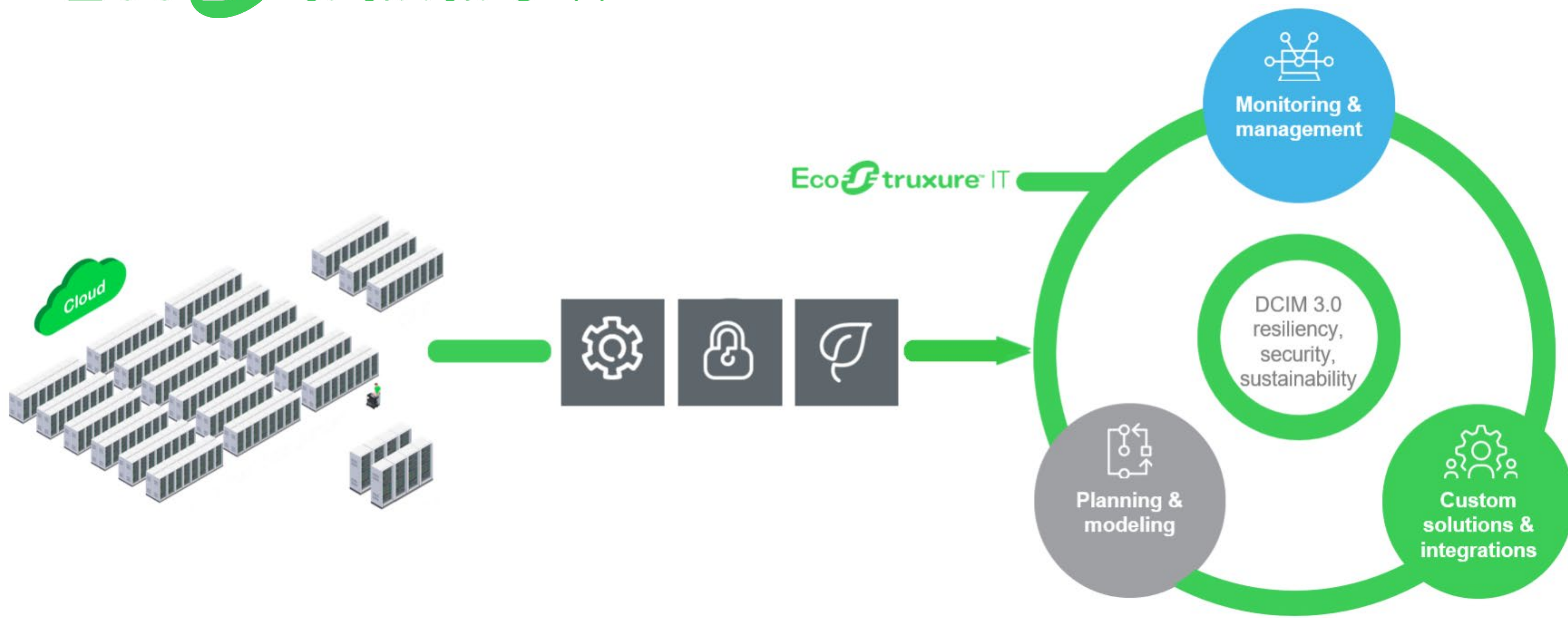
170 kWh
Total Energy

By providing more information these estimates could be more accurate.

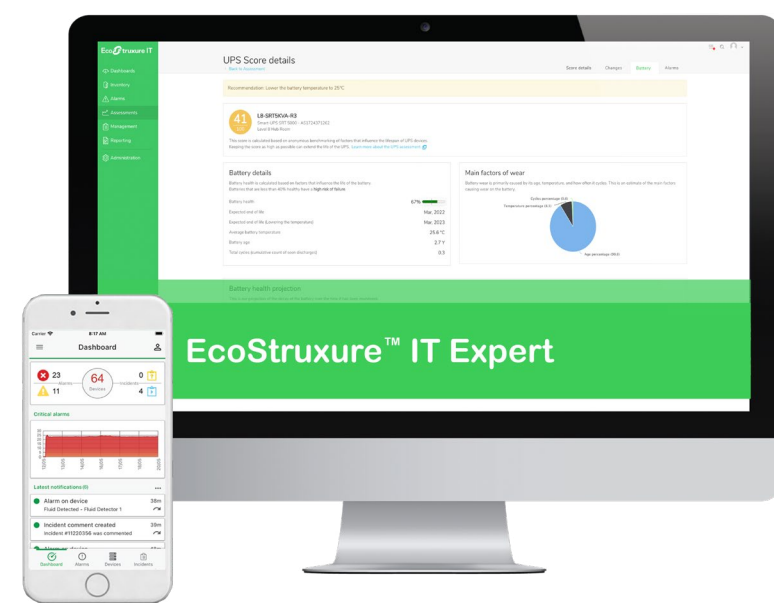
Calculation Factors:

- Power Redundancy: **N1**
- Cooling Redundancy: **N**
- Cooling Type: **Chilled Water**
- Cooling Details: **Cooling Tower**
- Time on Economizer: **1500 h**
- Reference Temperature: **20°C**

EcoStruxure™ IT



Making reporting for EED regulations easy



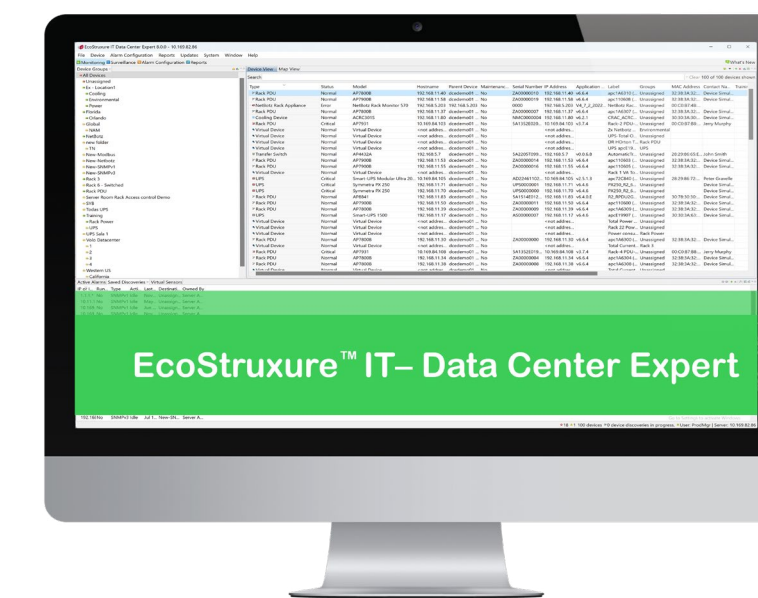
IT Expert (cloud based)
Included in current subscription

Vendor agnostic, secure solution that enables wherever-you-go monitoring and visibility into your IT physical infrastructure



IT Advisor (on-premises & cloud-based)
Included in current subscription for cloud-based and downloadable release for on-premises

Asset and planning software that enables data center managers to reduce OpEx and plan for uptime, with analytics to facilitate capacity planning decisions



Data Center Expert (on-premises)
Downloadable release

A scalable monitoring software that collects, organizes, and distributes critical device information providing a comprehensive view of equipment.

Your DCIM checklist for the 2024 EED directive

DCIM covers most data points

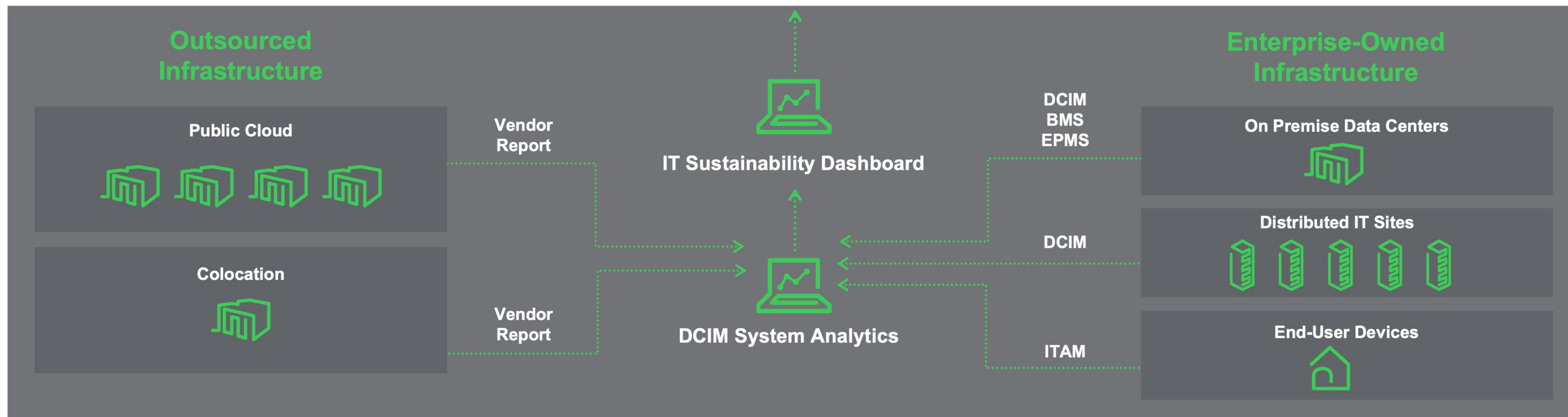
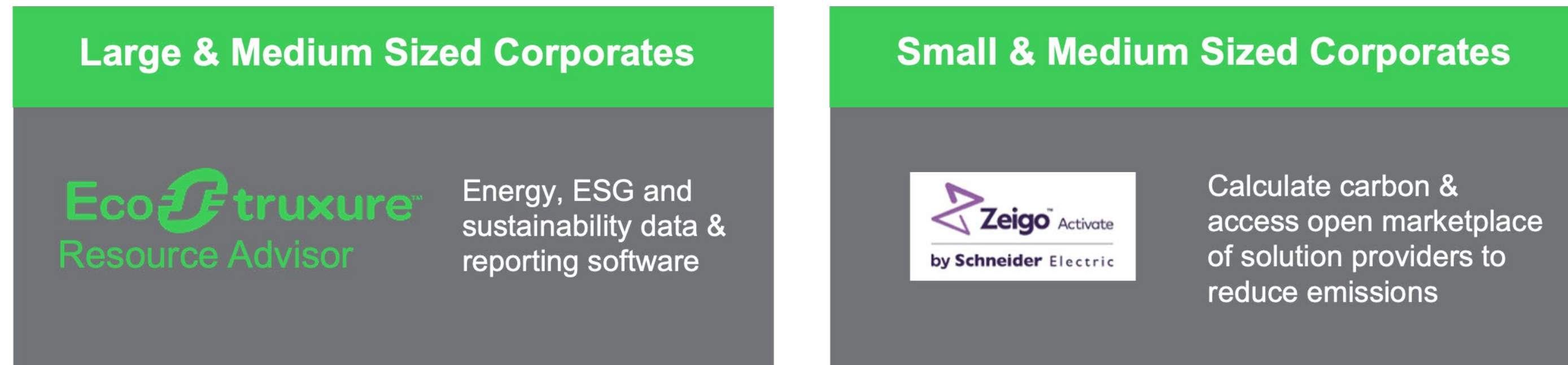
Our DCIM solution covers around 80% of the data points listed in the current EED directive.

Here's a useful checklist that highlights the data points that DCIM can help data center owners and operators with, when reporting on their EED data:

Data	Relevant Standard	Covered by DCIM Dashboard
Building Information		
Data centre name location, year constructed		
Type of data centre		✓
Name of owner/operator		✓
Stand alone or enclosed in building		✓
Building floor area		✓
IT floor area		✓
Installed power (Total facility power capacity)		✗
Annual incoming & outgoing data traffic		✗
Operations		
Electrical redundancy		✓
Cooling redundancy		✓
Number of modular capacity steps or provisioned halls		✓
Number of racks		✓
Rated IT electric load		✓
Power Usage Effectiveness (PUE)	EN50600-4-2	✓
Renewable Energy Factor (REF)	EN50600-4-3	Manual entry
IT Equipment Energy Efficiency for servers (ITEEsv)	EN50600-4-4	✗
Energy Reuse Factor (ERF)	EN50600-4-5	✗
Cooling Efficiency Ratio (CER)	EN50600-4-6	✓
Carbon Usage Effectiveness (CUE)	EN50600-4-7	✓
Water Usage Effectiveness (WUE)	EN50600-4-8	Manual entry
Total data energy consumption	EN50600-4-9	✓
IT equipment energy consumption	EN50600-4-2	✓
Stand alone or enclosed in building	EN50600-4-2	✓

DCIM: a key tool in Schneider Electric's overall sustainability tool set

Enabling IT sustainability and connection to enterprise-wide sustainability dashboard & software



The many benefits of sustainability reporting

EED can help to drive your business

So, as you can see, Schneider Electric's DCIM is an invaluable tool for preparing your data center sustainability reporting ahead of formal directives such as the EED initiative.

However, EED compliancy is just one of the many benefits that comes with tightening up on your sustainability data management.

Consider the additional benefits of accurate and comprehensive sustainability reporting:

- ▶ By optimizing energy consumption and adopting efficient technologies, you can **lower your data center operational expenses**
- ▶ Increased emissions transparency – means **easier data center planning & management**
- ▶ Your improved visibility on assets within your data center and critical data will drive **improved efficiency and operational resiliency**
- ▶ Your improved energy efficiency will reduce the strain of data centers on the grid, contributing to a **more resilient infrastructure and grid**
- ▶ Your improved energy efficiency will help **reduce greenhouse gas emissions** and will contribute to a **more sustainable data center industry**
- ▶ Your new EED certification will demonstrate your commitment to sustainable best practices - giving you a **competitive edge**, to help you attract new customers

Our commitment to your energy efficiency

In summary

To sum up, Europe's reliance on data centers is not going to go away. In fact, all the pointers indicate that our dependence on them is going to grow, massively. And so, regulations like the EED are not only a good thing for our industry but are essential in ensuring data centers become more efficient in the way they use energy.

As such, over the next few years, we can expect to see a roll-out of similar energy-related directives, that require data centers to report on key metrics, in order to drive energy-efficiency across our industry.

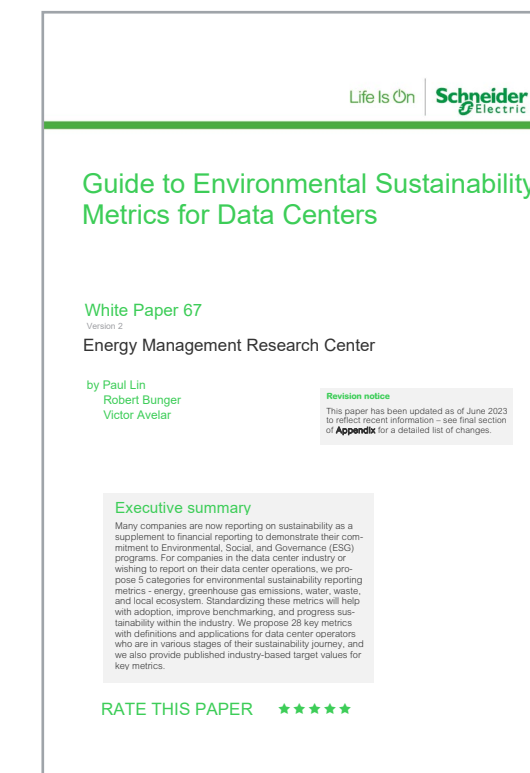
And because data tends to be spread across a company's organization, data center owners and operators will need to improve the way they manage this data at the site level or data center level.

Schneider Electric is committed to supporting our customers in managing their data and improving their data center energy efficiency. Our constantly evolving DCIM software tool monitors, measures, manages and controls data center utilization and energy consumption of the physical infrastructure, which ultimately enables accurate data center sustainability metrics and reporting.

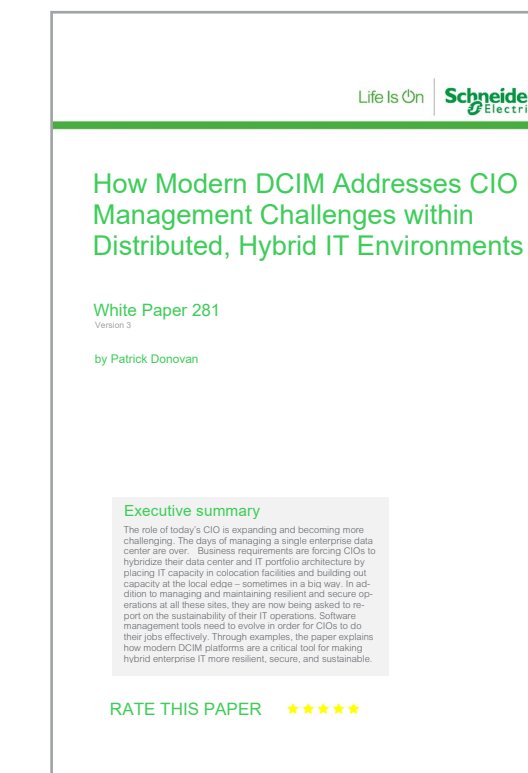
How to get started

A range of resources available from our Energy Management Research Center

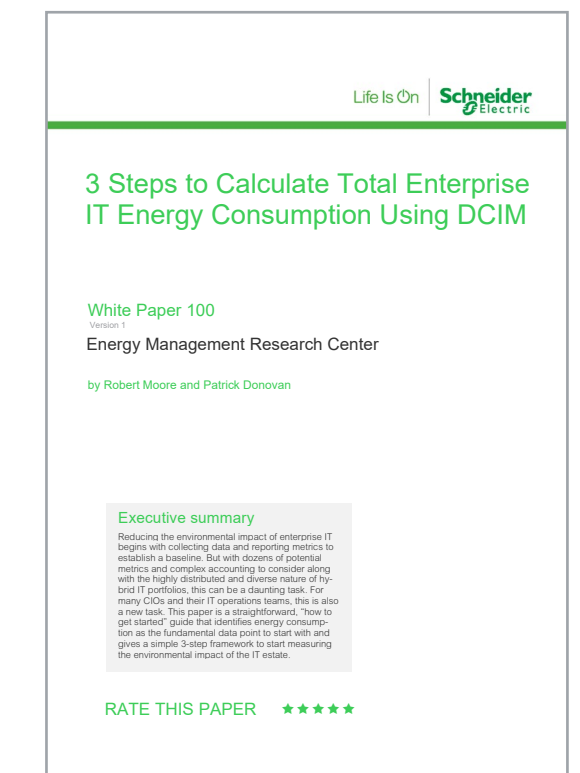
1. White Papers and Trade-off Tools from our Energy Management Research Center
2. Contact the experts at Schneider Electric through Global Sales/Marketing campaign



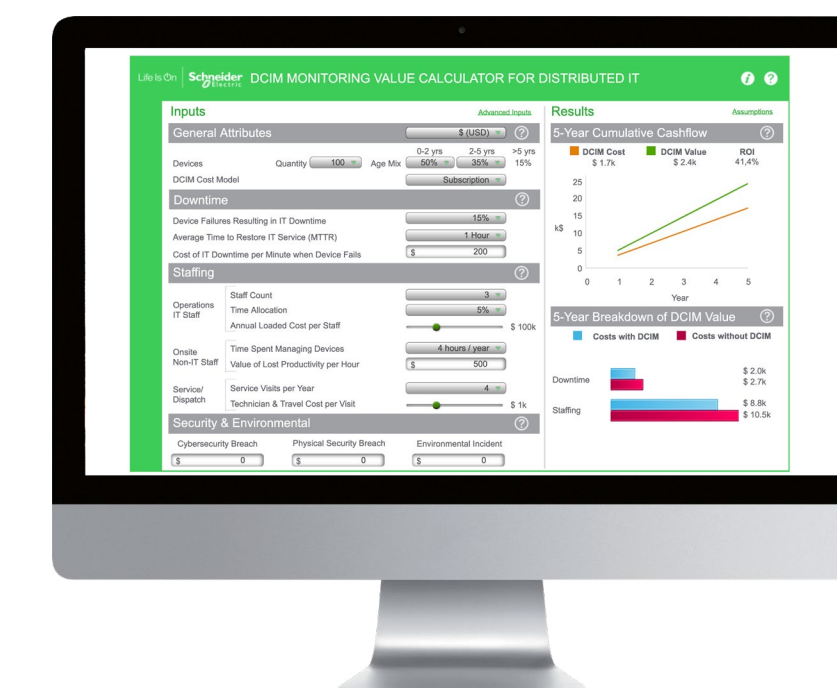
[WP67](#): Guide to Environmental Sustainability Metrics for Data centres



[WP281](#): How Modern DCIM Addresses CIO Management Challenges within Distributed, Hybrid IT Environments



[WP100](#): 3 Steps to Calculate Total Enterprise IT Energy Consumption Using DCIM

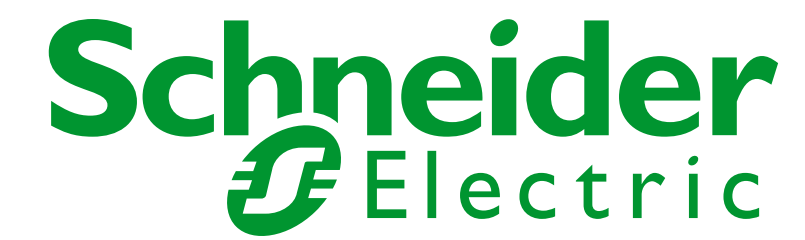


[DCIM Monitoring Value Calculator for Distributed IT](#)

Useful links

- ▶ [European Commission EED homepage](#)
- ▶ [Publications Office of the European Union: EU data center energy consumption trends](#)
- ▶ [451 Research: 'The Gap Between Enterprise Plans and Sustainability Programs for Core and Distributed IT'](#)
- ▶ [White paper - Schneider Electric WP67: A guide to environmental sustainability metrics for data centers](#)
- ▶ [White paper - Schneider Electric WP100: 3 Steps to Calculate Total Enterprise IT Energy Consumption Using DCIM](#)
- ▶ [White paper - Schneider Electric WP281: How Modern DCIM Addresses CIO Management Challenges within Distributed, Hybrid IT Environments](#)
- ▶ [Case study video: EcoDataCenter/DCIM](#)
- ▶ [Schneider Electric blog on sustainability/DCIM](#)
- ▶ [Schneider Electric TradeOff Tools for data centers](#)
- ▶ [DCD article: European Energy Efficiency Directive published, with mandatory data center reporting](#)

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