

Blueprint for *data centre efficiency*

A practical guide for turning EED compliance into competitive advantage

When **energy** matters

Introduction from Colin Dean at Socomec

Across the industry, pressure is building from every direction and throughout every colocation facility in the UK. The specific challenges may differ, but the direction of travel remains the same.

AI workloads are driving power demand to new heights, testing cooling capacity and electrical infrastructure in ways few predicted. Energy costs remain volatile. And now, under the EU Energy Efficiency Directive (EED), operators are being asked to prove exactly how efficiently they run.

These forces are, of course, deeply connected. AI isn't just increasing load – it's highlighting the growing importance of transparency and control. As racks draw more power and thermal limits tighten, even small inefficiencies have a bigger impact on energy performance and cost. That's why regulators, investors, and customers are all looking more closely at how power is monitored, managed, and reported.

For UK operators, these expectations are already shaping the market. While the EED doesn't yet apply here directly, its standards – accurate PUE reporting, renewable sourcing, circuit-level visibility – are becoming the baseline for procurement, investment, and sustainability decisions. Efficiency has become both a technical and a commercial issue.

That's where this blueprint comes in. It sets out a practical path to:

1. Establish transparency
2. Build visibility and control
3. Use data to drive measurable improvement
4. Embed resilience through change
5. Leverage efficiency to drive growth

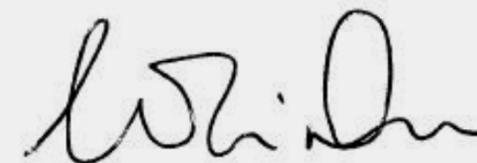
It's designed to help you address today's most pressing challenges – from compliance and capacity to cost and continuity – and show how transparency can strengthen both performance and trust.

In our view, that's how compliance starts to become a real point of competitive advantage.

I hope you find it a useful read and I'd be delighted to explore the issues raised in more detail.

Warm regards,

Colin Dean
UK Managing Director
Socomec



The blueprint **at a glance**

At the heart of this blueprint is a simple idea: that efficiency, transparency, and control are now the foundations of data centre performance. Energy efficiency has become both a technical measure and a business signal – one that influences investment, procurement, and customer trust. Delivering it well depends on accurate data, connected systems, and resilient design.

The following sections set out how to achieve that in practice. Each step focuses on a key area where small improvements can deliver measurable results: establishing transparency, building visibility and control, turning data into ongoing performance gains, and designing for long-term resilience and scalability.

This isn't about adding complexity or chasing targets for their own sake. Quite the reverse. It's about taking a structured, verifiable approach that links compliance with commercial impact – showing how better monitoring, smarter operation, and modular design work together to reduce cost, strengthen uptime, and build confidence.

Taken together, these are practical steps you can apply across your facility to make efficiency measurable, manageable, and repeatable.

Let's get started

Who should read this guide:

Leaders, engineers, and consultants responsible for the performance, compliance, and profitability of data-centre operations – especially those preparing for the tighter energy-efficiency standards now shaping the UK and European market.

Contents

- 1. Establish transparency**
- 2. Build visibility and control**
- 3. Use data to drive measurable improvement**
- 4. Embed resilience through change**
- 5. Leverage efficiency to drive growth**

STEP 1



Establish transparency

The first step is to make performance visible. Operators need to create a clear, verifiable picture of how energy is used across their facilities – one that can withstand both regulatory and commercial scrutiny. That means implementing accurate metering and consistent reporting processes capable of producing auditable data for every circuit and system. By establishing transparency early, operators can build the credibility, trust, and confidence that underpin every later stage of improvement.

Recognise efficiency as the new standard

Compliance with the EU's Energy Efficiency Directive is no longer just about meeting policy targets. It's fast becoming a benchmark for performance – even beyond the EU's borders. In today's market, transparency carries real commercial weight, with procurement teams expecting verifiable energy data before they commit. For operators, accurate reporting isn't only about satisfying regulators; it's how they demonstrate control, capability, and competitiveness in every renewal and new bid.

Today, across Europe, energy transparency is rapidly becoming a competitive currency. Under the revised Energy Efficiency Directive (Directive 2023/1791), data centres with an installed IT load of more than 500 kW are required to report their energy performance annually. This includes core efficiency metrics such as Power Usage Effectiveness (PUE), Water Usage Effectiveness (WUE), Energy Reuse Factor (ERF) and Renewable Energy Factor (REF) – the indicators set out in Annex VII. What began as a policy obligation is now defining how operators are judged by customers, investors, and regulators alike.

Establish **transparency**

Show your numbers

Transparency now carries commercial weight. Procurement teams expect accurate, auditable data on energy and carbon before awarding contracts or renewing leases. For colocation operators, being able to demonstrate efficiency and accuracy in reporting no longer just satisfies regulation – it actively strengthens credibility in every tender process. A facility that can prove its numbers, down to circuit-level granularity, offers the market a higher degree of confidence in its operational maturity, resilience, and cost control.

This expectation extends beyond the EU. While the EED itself applies to European territories, its principles serve as a yardstick for best practice in the UK and elsewhere. International customers and investors increasingly require the same degree of transparency in non-EU markets, and UK operators competing for multinational tenants or sustainability-linked finance are expected to provide comparable evidence. Demonstrating EED-style reporting is a pragmatic investment in credibility and future growth.

Close the measurement gap

The first EU reporting cycle in 2024 illustrated the scale of the challenge. Only around a third of eligible operators submitted complete data, with many facilities unable to meet the required granularity or validate their PUE figures with sufficient accuracy. Regulators have signalled that future cycles will include stricter enforcement and automated validation checks, raising the bar for measurement credibility.

Chose transparency as a differentiator

Behind these evolving expectations lies a broader shift in perception. Efficiency metrics such as PUE and REF are no longer viewed as internal engineering indicators but as external performance signals – benchmarks of competency, commitment, and cost-optimisation. Facilities that can demonstrate auditable, repeatable data build trust with customers and stakeholders in a way that unverified claims cannot. For operators, that transparency translates directly into bid success, investor confidence, and the ability to negotiate more favourable contracts.

Ultimately, compliance is becoming a commercial differentiator. The operators best positioned for growth will be those that treat reporting not as a cost of doing business but as a mechanism for showing the market exactly how well their facilities perform. Accurate, consistent data – across both energy use and electrical quality – builds trust, and trust builds advantage.



Meeting the Energy Efficiency Directive



By Jason Huxley, Energy Efficiency Sales Engineer, Socomec

“Only about a third of operators managed to submit full data sets during the first EED reporting cycle – and that tells you everything about the scale of the challenge. It’s not that people don’t care about compliance; it’s that gathering the right data, at the right level of detail, is hard in a live environment. But that grace period is closing fast. Regulators are already talking about automated validation and penalties for incomplete submissions. From here on, the expectation is clear: transparent, verifiable reporting as standard. For operators, this isn’t just a compliance issue. It’s a chance to show control, credibility, and confidence in how their facilities really perform.”

Assessment of the energy performance and sustainability of data centres in EU, First Technical Report, July 2023

At a glance: the EU Energy Efficiency Directive



- Directive 2023/1791, updated in 2023, strengthens Europe’s 2030 energy-reduction goals.
- Applies to data centres with an installed IT load of ≥ 500 kW, requiring annual reporting of energy and sustainability data.
- Annex VII defines the key performance indicators: PUE (Power Usage Effectiveness), WUE (Water Usage Effectiveness), ERF (Energy Reuse Factor) and REF (Renewable Energy Factor).
- The first reporting cycle in 2024 saw 36 % participation (770 facilities), with stricter enforcement expected in subsequent years.
- The directive establishes a new baseline for transparency, efficiency, and credibility across the European data centre market.

Source: European Commission, Assessment of the Energy Performance and Sustainability of EU Data Centres, 2025

STEP 2



Build visibility and control

Once transparency has been established, the next step is to turn that information into active insight. Operators need real-time visibility of how power moves through their facilities – from incoming supply to critical load – and the ability to act on what they see. Building control starts with accurate, circuit-level metering and monitoring, ensuring that every change in performance or demand can be measured, understood, and managed without disruption. With the right systems in place, visibility becomes the foundation for smarter decisions and stronger resilience.

Map your electrical chain

Understanding how energy moves through the data centre – where it's consumed, lost or recovered – is the foundation of every improvement that follows. Most operators already collect some form of energy data, but it's often fragmented across electrical, mechanical and IT systems. Incomplete or inconsistent datasets make it hard to verify performance or identify inefficiencies. Building continuous visibility across the electrical chain allows operators to move from reactive compliance to proactive control.

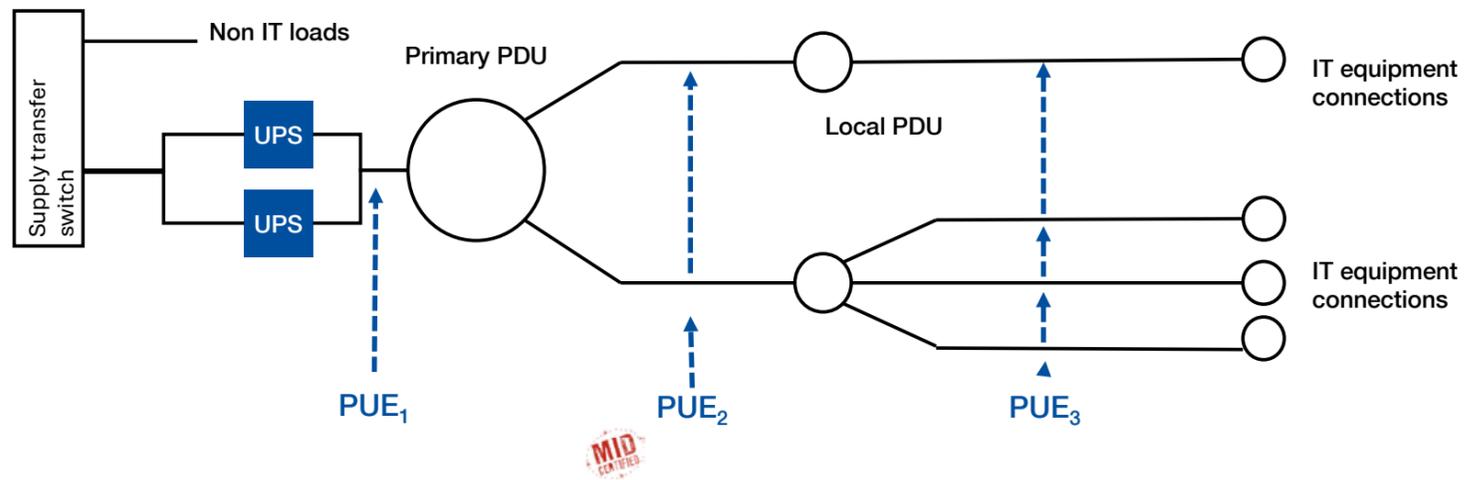
Capture real performance, not estimates

Accurate visibility starts with measurement. Many legacy monitoring systems rely on aggregated readings or estimates that obscure how power is actually used at rack, circuit or equipment level. As regulatory and commercial scrutiny grows, that isn't enough. Circuit-level monitoring – at the granularity defined in EN 50600-4-2 Category 3 – gives operators the ability to pinpoint consumption, losses and imbalance with raceable accuracy. It's also the basis of credible Power Usage Effectiveness (PUE) reporting, since the precision of the data directly affects the validity of the metric.

Build visibility and control

Track power quality

Understanding power quality is also key. Poor electrical quality – from harmonics, imbalance or voltage fluctuation – can distort readings, reduce efficiency, and shorten asset life. Tracking these parameters alongside energy use helps detect degradation early and maintain consistent performance.



Category 1 (PUE1)
Basic level of resolution of energy performance data.

Category 2 (PUE2)
Intermediate level of resolution of energy performance (data hall).

Category 3 (PUE3)
Advanced level of resolution of energy performance data & load balancing.



Unify and deploy

Even where metering exists, it's often unevenly deployed. Different systems, sampling intervals, or formats create data silos. Integrating these into a single framework gives a complete picture of performance. A unified system ensures that measurements across switchgear, UPS, cooling, and IT share the same reference and accuracy. This consistency lets operators compare loads, trace anomalies, and align energy data with sustainability reporting.

Phased deployment also avoids disruption. Many operators upgrade monitoring in stages, focusing first on critical areas or those with the biggest uncertainty. Incremental deployment reduces risk and ensures service continuity in live environments. Targeting weak points first quickly improves accuracy where it counts, building a solid foundation for deeper analysis.



Visibility in practice: Six Degrees



Six Degrees, a leading UK technology service provider, wanted to improve control and efficiency across its live data centre estate without disrupting operations. By deploying Socomec's DIRIS Digiware system, the company gained precise, real-time insight into how energy is used – from data halls to individual pump sets – supporting smarter, evidence-based decisions.

Key outcomes:

- Retrofitted monitoring live with no downtime.
- Fast install, reducing disruption and cost.
- Achieved Class 0.5 accuracy at circuit level.
- Verified efficiency gains and balanced loads.
- Accurate data used to track and improve performance over time.

[SEE FULL CASE STUDY](#)

STEP 3



Use data to drive measurable improvement

With accurate data in place, the next step is to turn information into improvement. Operators need to move from passive monitoring to active management – using insight to prioritise actions, verify outcomes, and drive measurable efficiency gains. This step is about translating visibility into value: connecting what’s measured to what matters, so every decision has a traceable impact on cost, carbon, and capacity.

Turn insight into action

Collecting data isn’t the goal – using it well is. Once energy information is accurate, complete, and continuous, the focus shifts from recording to improving. The operators achieving the strongest results are those turning data into decisions: identifying inefficiencies, prioritising actions, and tracking outcomes over time. Visibility becomes a feedback loop – one that enables continuous optimisation across energy, capacity, and cost.

Use data to boost performance

Effective monitoring stops being a technical function and becomes operational strategy. Detailed energy data reveals the patterns behind high PUE values, imbalanced loads, or unexpected peaks. Identifying these at source lets teams correct them before they lead to losses or downtime.

For colocation operators, data-backed improvement brings both operational and commercial impact. Load balancing and phase correction reduce losses; smarter operation extends equipment life and lowers maintenance cost. More accurate metering also enables transparent billing – cutting disputes and strengthening customer confidence. Over time, these gains deliver measurable OPEX reductions and faster payback on modernisation.

Use data to drive **measurable improvement**

The impact of incremental efficiency gains

Even small improvements in data centre efficiency can deliver significant returns. A reduction in PUE from 1.6 to 1.5 in a 2 MW facility equates to around 10 % less energy consumed by supporting infrastructure – typically saving more than €150,000 a year at current European electricity prices. Beyond cost, those savings represent lower carbon emissions and greater capacity headroom for additional IT load. Measured, verified data makes these gains repeatable, allowing operators to track progress and justify future investment with confidence.

Source: European Commission, Assessment of the Energy Performance and Sustainability of EU Data Centres, 2025

Benchmark and build intelligence

With consistent data across systems and sites, operators can benchmark their performance – internally over time, or externally against comparable facilities. This benchmarking capability turns compliance metrics into business intelligence, highlighting where investments in equipment, cooling, or control systems deliver the greatest benefit. It also supports sustainability reporting, allowing operators to demonstrate credible progress against efficiency and carbon goals. Crucially, this data-driven approach creates a shared language between operations, finance, and ESG teams – linking technical performance directly to business outcomes.

Make improvement continuous

The most efficient data centres treat monitoring as a continuous process rather than a one-time upgrade. Each cycle of measurement, analysis, and adjustment refines performance further, creating an upward spiral of efficiency and resilience. In this model, energy visibility becomes not just a compliance tool but an engine for operational excellence – one that enhances reliability, reduces cost, and underpins long-term competitiveness.



STEP 4



Embed resilience through change

True resilience isn't just about avoiding failure; it's about adapting safely when things change. As new technologies, loads, and sustainability goals reshape data-centre design, operators need systems and processes that keep services live while infrastructure evolves. This step focuses on embedding flexibility into both architecture and operation – ensuring continuity, control, and confidence in every stage of growth.

Design for scale and flexibility

Resilience is, of course, the foundation of confidence in every data centre. In a sector where downtime carries immediate cost, it's measured not only in uptime but in the ability to evolve without disruption. As infrastructure expands to support new technologies and densities, maintaining continuity during change has become the key test of operational maturity.

Traditional redundancy remains critical, but resilience now means more. Operators need architectures that absorb new loads, integrate renewables, and support upgrades while live.

Modular distribution and scalable UPS configurations make it possible to extend capacity or replace equipment without taking racks offline.

Manage transition without interruption

As we've seen, AI, sustainability targets, and grid interaction are all reshaping operation. Facilities must handle fluctuating demand and new power technologies while maintaining service continuity. Phased upgrades with clear isolation and changeover procedures let operators evolve safely. The best strategies treat resilience and efficiency as complementary goals.

And resilience depends on process as much as design. Regular testing, preventive maintenance, and clear continuity procedures give teams confidence under pressure. Documented testing and accurate performance data reduce uncertainty during incidents and audits. Resilience isn't static – it's the discipline of ensuring every component behaves predictably when it matters.

The real cost of disruption



As data centres modernise, the risk of disruptions grows. Power failures remain one of the most common causes of unplanned downtime in data centres. According to the Uptime Institute, around 36 % of major service outages are linked to power issues, making electrical infrastructure the single biggest risk to continuity. The financial impact can be severe: more than half of operators report that their most recent serious outage cost over \$100,000, and around 16 % exceeded \$1 million. In total, a third of all outages now cost more than \$250,000. Together, these figures highlight the value of resilient, modular systems that enable operators to upgrade and expand safely, reducing the likelihood – and the cost – of downtime.

Source: Uptime Institute – Annual Outage Analysis 2023

STEP 5



Leverage efficiency to fund growth

The final step is about turning efficiency into momentum. Once visibility, control, and resilience are in place, every improvement can feed the next – creating a self-sustaining cycle of performance and investment. By treating efficiency as a dynamic process rather than a fixed goal, operators can unlock new capacity, reinvest savings, and sustain growth while keeping energy use in check.

Turning savings into capacity

Efficiency is about more than saving energy – it's about releasing potential. Every kilowatt saved cuts cost and carbon, but also frees capacity for future demand. Treating efficiency as a continuous improvement loop lets operators use the savings and headroom they create to support growth and meet sustainability targets.

Within the same electrical footprint, improved utilisation can release significant headroom for new workloads or expansion. Reducing losses, correcting power factor, and balancing phases all translate directly into more available kilowatts for IT load. Operators are also using demand management and short-term energy storage to smooth consumption peaks and stabilise grid costs.

At a time when power availability is becoming a constraint in many markets, these incremental gains can determine how quickly new tenants or AI workloads can be brought online. Efficiency, in this sense, becomes a form of capacity planning. The operators that treat efficiency gains as a resource – rather than a one-time achievement – are the ones able to grow sustainably while keeping energy performance under control.

Reinvest to modernise

The wider financial benefits are significant. Lower OPEX supports stronger margins, while the energy savings achieved can be reinvested into further upgrades – from metering and automation to renewable integration and storage. This cycle of saving and reinvestment allows operators to modernise incrementally rather than through disruptive overhaul, aligning operational improvements with the rhythm of commercial growth. It also creates a self-financing pathway toward decarbonisation, using operational savings to fund sustainability commitments.

The value of a 0.1 PUE improvement



For a 2 MW data centre, improving PUE from 1.6 to 1.5 can reduce total annual energy consumption by around 6–8 %. At current European electricity prices, that equates to roughly €120,000–€160,000 in yearly savings. The impact goes beyond cost: lower losses free capacity within the existing power envelope and delay the need for major infrastructure upgrades.

Source: Socomec internal EED performance analysis; Uptime Institute, Improving Data Center Energy Efficiency, 2024

Keep improving

True efficiency is not a milestone but a process. Once the baseline is established and early gains are made, the same monitoring data that drives compliance and reporting can identify new opportunities for refinement – whether through load redistribution, smarter cooling strategies, or predictive maintenance.

As systems become more connected, operators can correlate power, cooling and workload data to pinpoint the causes of hidden losses and prioritise the fixes that deliver the biggest return. Smarter operation, stable power quality, and proactive maintenance extend the life of critical assets, avoiding premature replacement and supporting long-term performance.

The operators achieving lasting impact treat efficiency as a continuous loop: measure, act, validate, and improve again. Tracking progress through clear, comparable KPIs ensures that improvements are visible, verifiable, and aligned with both operational and sustainability goals. The discipline of regular measurement also gives leadership teams confidence to plan new investments, knowing that performance and compliance are fully evidenced.

Use efficiency as competitive advantage

Energy efficiency is also the natural outcome of everything that data centre teams do well – precision in monitoring, balance in operation, and discipline in maintenance. Reducing losses means less stress on equipment, fewer unplanned interventions, and longer asset life. The cumulative effect is a facility that runs cooler, cleaner, and more predictably – an operation where performance, reliability, and sustainability reinforce one another.

Under the EU's Energy Efficiency Directive, these operational disciplines have taken on new strategic importance. Measured, verifiable efficiency is now the clearest signal of compliance – and increasingly, of competitiveness. Operators that can demonstrate continuous improvement and auditable performance aren't just meeting regulation; they're setting the benchmark for what good looks like.

And when compliance drives measurable efficiency, and efficiency drives competitiveness, regulation moves from a constraint to a very real catalyst for progress.

Delivering that level of precision and reliability in live environments takes the right combination of technology, design, and expertise – which is where Socomec's experience comes in.

From compliance to competitive advantage with Socomec

The previous steps show how data centre efficiency can evolve - from transparency and visibility through to control, resilience, and growth. This closing section brings those principles together in practice. It shows how Socomec helps operators apply the blueprint: combining precision engineering, modular design, and digital intelligence to turn everyday compliance into a lasting competitive advantage.

Energy compliance isn't a cost of doing business; it's a smarter way to cut OPEX, protect uptime, and strengthen competitiveness. That belief underpins Socomec's approach to data centre performance.

Socomec brings precision engineering and reliability to EED-compliant operation. Its technologies measure, manage, and maintain electrical performance with the accuracy that regulators and customers demand. Across monitoring, switching, and power conversion, every system is built for repeatable, auditable results operators can trust.

The same principle guides Socomec's modular, retrofit-safe design. Whether expanding capacity, integrating renewables, or upgrading legacy systems, its solutions protect uptime while delivering high efficiency and long service life. The results are proven in large-scale retrofits such as 6Degrees, where safe deployment and verifiable data have delivered clear ROI.

Today, credible energy metrics are a differentiator in every audit and procurement cycle. Socomec helps operators capture and demonstrate that credibility – through advanced monitoring, flexible finance models, and digital services that link performance data directly to business value.

In an era defined by AI demand and rising energy intensity, Socomec provides the expertise and technology to keep data centres efficient, compliant, and competitive – turning precision into progress, and compliance into advantage.

Our product portfolio

Introducing the Socomec energy-saving portfolio:

- **DIRIS Digiware | Accurate, auditable visibility**
Multi-circuit monitoring system providing Class 0.5 accuracy and MID Class C certification. Enables detailed energy reporting, billing, and power-quality analysis in live environments – delivering the precision needed for EED-compliant performance.
- **MODULYS UPS | Modular resilience by design**
High-efficiency (up to 99.1 %) UPS architecture with no single point of failure and hot-swappable modules. Supports scalable growth, predictable uptime, and long equipment life while maintaining peak efficiency under variable loads.
- **DELPHYS XM | High-efficiency modular UPS**
Delivers up to 99 % efficiency with 100 kW power modules in a compact footprint. Ensures continuous uptime and scalable performance for high-density, mission-critical environments.
- **ATyS Transfer Switching | Continuity with control**
Automatic and manual transfer switches ensuring safe, reliable changeover between sources in 5–8 ms. Maintain supply integrity during upgrades or maintenance, safeguarding uptime in live, mission-critical environments.
- **SUNSYS Energy Storage | Peak control and flexibility**
Battery-based storage that manages grid peaks, integrates renewables, and provides quiet, sustainable backup. Helps stabilise tariffs, optimise on-site generation, and reduce reliance on diesel generation.
- **SoLink & SoLive | Digital services for predictive performance**
Remote-monitoring and analytics platforms that track asset health, enable preventive maintenance, and shorten mean-time-to-repair – transforming maintenance from reactive to predictive.

Partnering for precision: the M²i specialist network



Partnering for precision: the M²i specialist network
Socomec's Metering & Monitoring Integrator (M²i) network connects technology with compliance expertise to accelerate EED-ready performance. For data centre operators, it means faster, lower-risk deployment of accurate metering and monitoring systems – delivered by accredited partners who understand both the technology and the reporting standards. Each partner combines Socomec's Class 0.5 precision technology with local insight into energy strategy, sustainability frameworks, and operational constraints. The result is simpler, safer modernisation: verifiable data, confident compliance, and measurable progress without disruption.



See your efficiency-saving potential

Book a complimentary Energy Efficiency Audit to receive a live performance snapshot of your data centre.

Our specialists will provide:



A site audit



Proof of Concept Monitoring
Install on 2 streams



Energy Efficiency
Optimisation Report

Install non-intrusive monitoring on key circuits, analyse consumption and power quality, and provide a clear roadmap for achieving EED-ready compliance and measurable savings.

Get in touch or find out more here.

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When **energy** matters