

5G Networks Data Centre Energy Upgrades

Canonical: <https://northmoregordon.com/case-studies/5g-networks-optimize-the-country-with-energy-upgrades/>

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5G Networks upgraded electrical and cooling systems at a recently acquired Melbourne data centre. The project combined new uninterruptible power supplies, building controls and airflow changes with a project-based measurement and verification plan under the Victorian Energy Upgrades program.

Evidence note: The figures below are historical results reported in the source case study published on 13 May 2025. They describe this project and should not be treated as a current certificate quote or a guaranteed result for another data centre.

Project context

Data centres must reduce energy use without weakening uptime, equipment conditions or service quality. At this facility, ageing equipment, high electricity costs and cooling performance all affected the investment decision. The upgrade therefore needed an engineering case, an operational case and a certificate evidence plan.

Northmore Gordon's role

Prepared the measurement and verification plan and defined the project boundary.

Collected site data and supporting records, then developed baseline and operating energy models.

Responded to regulator requirements and supported the project through the Victorian Energy Upgrades process.

Provided certificate price certainty so the forecast incentive could be incorporated into the investment case.

The installed measures included two high-efficiency UPS units, a new building management system, temperature-set-point and chiller optimisation, aisle partitioning and a hot-aisle/cold-aisle airflow approach. Measurement also identified inefficient auxiliary pumps.

Reported project results

Reported annual energy saving: 310 MWh

Reported annual carbon abatement: 335 tCO₂-e

Reported annual operating saving: about \$50,000

Reported certificate value: about \$85,000

Project capital value: about \$300,000

Reported payback: about four years

Improved UPS reliability and operating conditions for hosted equipment.

Created a documented savings case for a project-based VEU activity.

Separated recurring operating savings from certificate value in the commercial assessment.

What this project shows

A data-centre upgrade should be assessed as a system. UPS efficiency, cooling controls, air separation, set points and auxiliary equipment interact, so a single equipment rating is not enough to prove whole-project savings.

The evidence plan should be established before installation. Baseline data, operating variables, commissioning records and post-project measurements all affect whether savings can be verified and whether a certificate claim can withstand review.

Related guidance

Measurement and verification for energy efficiency

Energy audits

Uninterruptible power supplies

Compressed-air efficiency

Environmental certificates

More case studies

Discuss a comparable energy, carbon or certificate project with Northmore Gordon .

What specific UPS and building management upgrades did 5G Networks implement at their facility?

5G Networks installed two new high-efficiency Uninterruptible Power Supplies (UPS) and a Building Management System (BMS) as part of their energy upgrade project. The scope also included aisle partitioning to improve cooling efficiency. These telecommunications infrastructure upgrades were designed to enhance both reliability and operational performance while reducing energy consumption. The project demonstrates how critical data centre systems can be optimised for efficiency without compromising the service availability that telecommunications operators require for continuous network operation.

How did Northmore Gordon support 5G Networks through the Victorian Energy Upgrades program?

We provided comprehensive support over eight months to ensure VEU compliance through multiple workstreams. They developed the measurement and verification plan, collected site data and supporting evidence, built baseline and operating energy models to calculate savings accurately, and provided certificate price certainty. This structured approach addressed the complex VEU requirements by establishing credible evidence that energy improvements achieved intended outcomes. The rigorous M&V methodology separated equipment improvements from operating condition changes, protecting both certificate validity and financial returns.

What were the key financial and environmental outcomes of the 5G Networks project?

The project delivered annual energy savings of 335 tCO₂-e carbon abatement with approximately \$85,000 in environmental certificate value and \$50,000 in annual operating expenditure savings. These distinct metrics serve different purposes in the investment case: energy savings measure consumption reduction, operating savings represent direct cost benefits, and certificate proceeds provide financial returns subject to scheme conditions and market pricing. The company-reported figures demonstrate how energy efficiency improvements generate multiple value streams, though independent verification and current repeatability remain to be confirmed.

What operational benefits did 5G Networks gain beyond energy and cost savings?

Beyond energy efficiency gains, the measurement and verification process identified faulty and inefficient auxiliary equipment, particularly pumps, enabling targeted remediation. The UPS upgrades enhanced system reliability and operating conditions for critical telecommunications infrastructure. These operational improvements extend beyond the initial project scope by strengthening overall data centre performance and resilience. The example illustrates how comprehensive energy audits and M&V; investigations often reveal equipment performance issues that present separate maintenance or replacement opportunities aligned with business priorities.

Why is measurement and verification critical for Victorian Energy Upgrades projects?

Measurement and verification establishes credible evidence that energy improvements achieve intended outcomes by comparing pre- and post-upgrade performance under comparable operating conditions. M&V; determines counterfactual energy use without intervention, separating equipment improvements from changes in weather, operating hours, or production. For VEU projects, this rigorous approach protects certificate validity, demonstrates compliance with scheme requirements, and ensures accurate financial returns. The central M&V; question addresses what energy would have been consumed without the intervention, making this methodology essential for credible savings quantification.

How should organisations decide between prescribed and project-based activities under Victorian Energy Upgrades?

Prescribed activities use standardised equipment requirements with predefined savings calculations, while project-based activities warrant investigation for complex sites like data centres. The choice depends on technical feasibility, available evidence quality, and whether the project meets specific method requirements. Early identification of the applicable pathway is critical because measurement and verification evidence must exist before equipment changes occur. The correct choice requires technical and procedural assessment rather than selecting the pathway showing largest estimated certificate quantity, ensuring eligibility confidence before implementation commitment.

What distinguishes 5G Networks' certificate value from other financial benefits in the investment case?

The approximately \$85,000 certificate value, \$50,000 annual operating expenditure savings, and energy reduction are separate metrics with distinct purposes and uncertainties. Energy savings measure physical consumption reduction; operating expenditure savings represent direct cost benefits from reduced energy purchases; certificate proceeds provide financial returns subject to scheme acceptance and market conditions. Investment decisions should present these benefits distinctly, showing certificate price and quantity assumptions separately from operational savings. This separation prevents overstating returns and enables clearer comparison against base-case scenarios without unconfirmed incentives.

How can data centre operators apply 5G Networks' experience to their own efficiency projects?

Data centre operators should investigate whether UPS systems, cooling infrastructure, and building management controls present similar optimisation opportunities. Start with an energy audit to identify site-specific causes of high consumption, then scope measurement and verification early to establish baseline conditions before any equipment changes. Engage with certificate schemes at the relevant project stage to determine applicable pathways and secure funding options. The 5G Networks example demonstrates that auxiliary equipment like pumps often merit targeted investigation, and that comprehensive M&V; support helps navigate complex Victorian Energy Upgrades requirements.