

Energy optimisation for industrial, commercial and utility sites

Canonical: <https://northmoregordon.com/energy-optimisation/>

Details:

Energy optimisation is the process of understanding how a site uses and buys energy, identifying practical improvements, building an investment case, delivering approved work and confirming that the expected result is sustained. We provide this support for industrial facilities, commercial buildings and utilities across Australia and Singapore. The right first step depends on the decision required. A site with unexplained costs may need an energy-use investigation. A business comparing many opportunities may need a Type 2 audit. A major plant replacement may require detailed measurement and feasibility work. A completed project may need measurement and verification. To scope the work, provide the site location, operating constraints, available data, current project stage and decision deadline.

When an energy optimisation review is useful

Common triggers include:

Energy costs have increased without a clear operational explanation.

A boiler, refrigeration plant, compressed-air system, HVAC system or pumping process appears inefficient.

Gas reduction, electrification or renewable heat options need to be assessed.

Several projects are competing for capital and need a consistent comparison.

A grant or certificate pathway may affect project timing or evidence.

Savings forecasts need to be verified after implementation.

A multi-site organisation needs consistent metering, reporting and performance management.

Climate or energy reporting requires better operational evidence. Energy optimisation should preserve the outcomes the site exists to deliver. Production rate, product quality, process temperature, treatment performance, occupancy, reliability and asset availability may all constrain the solution.

Choose an assessment that matches the decision

Energy-use investigation

An investigation focuses on a defined question, such as why electricity demand changed or why a facility's energy intensity increased. It can combine bills, interval data, operating hours, production records, weather, tariff information and known site changes. The output should distinguish observations from conclusions, identify data gaps and recommend the next decision. If existing information cannot resolve the issue, the next step may be targeted measurement rather than a broad audit.

Type 1 energy audit

A Type 1 audit provides an overview of energy use and potential improvement areas. It is useful for establishing priorities and deciding where deeper work is justified.

Type 2 energy audit

A Type 2 audit provides more detailed technical and financial assessment across a site. It can support an opportunity register, prioritisation and early capital planning. Each opportunity should state its boundary, estimated effect, assumptions, dependencies, evidence quality and recommended next step.

Type 3 energy audit

A Type 3 audit is a detailed assessment of a major subsystem or opportunity and normally requires additional measurement. It is suited to decisions where the cost, operational impact or uncertainty justifies a more precise evidence base. An audit identifies and assesses opportunities. Procurement, detailed design, implementation and verification remain separate decisions.

Benchmark utilities and major systems

Utility benchmarking compares the actual or expected performance of systems such as boilers, refrigeration and compressed air with relevant performance measures. It can help distinguish avoidable losses from the energy required to deliver production. An effective review considers:

loads and operating profiles;

temperatures, pressures and flow requirements;

equipment condition, controls and sequencing;

production or occupancy patterns;

maintenance history;

distribution losses and idle operation;

interaction with other plant;

tariffs and demand charges. The purpose is to identify the cause of performance, not simply label a system efficient or inefficient.

Build a metering and monitoring plan

Good decisions require data at the boundary relevant to the project. A metering plan can specify instruments, locations, intervals, communications, validation checks and responsibility for maintaining the data. Metering should be designed around the question it must answer. Whole-site electricity may support portfolio reporting but be insufficient for verifying a compressor upgrade. Temporary logging may answer a feasibility question without creating an unnecessary permanent system. Where certificates or verified savings are expected, baseline requirements should be established before equipment changes occur. Our described work includes metering plans, costing, purchasing support and installation oversight. Bulla Dairy is a published example of this type of engagement.

Assess renewable heat and electrification

Reducing gas use in industrial and commercial facilities requires more than selecting a heat-pump model. A feasibility study can examine:

required temperatures and heat quality;

hourly and seasonal load profiles;

available waste-heat sources;

heat-pump or electric-boiler options;

heat recovery and process integration;

electrical capacity and network constraints;

redundancy and production risk;

staged implementation;

capital, energy and maintenance assumptions;

grants or certificate pathways. The result should show which options are technically possible, which are commercially credible and what evidence remains unresolved.

Turn opportunities into an investment case

A business case should connect the operating problem, baseline, proposed intervention, dependencies, costs, savings method, risks and implementation plan. Different value streams should remain separate:

| Value stream | What should be shown | | --- | --- | | Energy savings | Baseline, calculation method, prices and operating assumptions | | Tariff savings | Demand, time-of-use or contract effects | | Maintenance benefits | Avoided work, replacement timing and evidence | | Grant support | Program, round, eligibility, status and conditions | | Certificate proceeds | Scheme, method, evidence, quantity and commercial treatment | | Emissions outcomes | Boundary, factors and whether the result is forecast or measured |

Conditional grants and unconfirmed certificates should be modelled as separate scenarios. Management should be able to see whether the project remains viable if that support is delayed or unavailable.

Capture grants and certificate value at the right time

Funding and certificate rules can affect project sequencing. Applicant eligibility, project eligibility, round dates, eligible expenditure, approval conditions and evidence requirements should be checked before relying on support. For environmental certificates, the relevant scheme, activity, calculation method, customer nomination, ownership and pre-installation evidence may all matter. An installed project does not automatically qualify, and an invoice alone may not establish entitlement. Early assessment helps the project team preserve the information required for a valid application while avoiding unsupported claims in the investment case.

Deliver and verify the project

Approved work may require procurement support, project management, commissioning and coordination with operations. Verification planning should be integrated before installation whenever possible. Measurement and verification compares post-project use with a credible estimate of what energy use would have been without the intervention under comparable conditions. A plan defines:

the project and measurement boundary;

baseline period and data;

relevant operating variables;

calculation or model;

measurement responsibilities;

reporting period;

treatment of missing data and changes. Verified savings are different from audit estimates and feasibility forecasts. Reports should label identified, forecast and verified outcomes accurately.

Sustain performance after implementation

Energy performance can drift as production, controls, maintenance and staff practices change. Ongoing management may include performance indicators, exception review, reporting, opportunity tracking and periodic reassessment. We describe moreData as supporting data collection from meters, retailer bills, portals and control systems; energy and water balances; performance indicators; opportunity analysis; solar and emissions-accounting support; procurement analysis; NGER reporting and portfolio planning. The Net Zero Platform supports site and portfolio transition planning. Required modules and integrations should be confirmed for each deployment.

The six-stage delivery approach

We connect energy projects through six stages:

Assess opportunities and evidence through audits, benchmarking, modelling and metering.

Build the Case through strategy, feasibility and investment analysis.

Capture Value through grants, certificates and financing pathways.

Deliver approved work and establish verification.

Procure energy, equipment and environmental attributes.

Perform through reporting, management, review and multi-site expansion. A project can begin at any appropriate stage. Existing evidence should move forward with the work, including baselines, assumptions, ownership, measurement boundaries and result status.

Systems and sectors

Our supplied capabilities cover industrial facilities, food and beverage manufacturing, animal processing, aquaculture, commercial buildings, and water and wastewater utilities. Relevant systems can include process heat, boilers, steam, refrigeration, compressed air, pumps, aeration, HVAC, chillers, variable-speed drives, cogeneration, biomass, heat pumps, solar, batteries and metering infrastructure. Water-sector assessments can include pumping and distribution, treatment, aeration, biogas, renewable generation, storage and staged emissions planning. Industrial engagements may focus on production-specific thermal loads, refrigeration, heat integration and operational constraints.

What published projects demonstrate

Our published project accounts show how different stages can fit together:

A regional Victorian water corporation used organisation-wide energy management and assessment of 14 high-energy sites, with more than 65 opportunities identified and company-reported annual opportunities above \$500,000.

GWMWater's integrated strategy included 6.5 MW of solar, 6.5 MWh of battery storage and load optimisation, with approximately \$1.3 million in reported annual savings.

Aurora Place involved HVAC, chiller and variable-speed-drive upgrades, with 309,000 kWh in reported annual savings.

MainStream Aquaculture examined heat pumps and available waste heat, with approximately \$113,000 in forecast annual energy-bill savings.

Nomad Coffee received a Type 2 audit considering energy use, tariffs, short-term metering and production intensity.

Greenham's multi-site work included energy auditing, biomass, solar and cogeneration investigations. These figures describe the published projects and do not establish results for another site. Scope, baseline, operating conditions, prices, evidence and scheme rules must be assessed for each engagement.

What to prepare

Provide the information already available rather than waiting for a perfect dataset:

organisation, facility and site location;

the business decision and deadline;

current project stage;

bills and interval data;

production, occupancy or treatment records;

equipment lists, drawings and control information;

previous audits, studies and quotes;

known operating constraints;

grant, certificate or reporting requirements;

implementation dates and prior incentives. Estimates should be identified as estimates. Missing information should be recorded with an owner and collection plan.

How an engagement progresses

Define the business problem and the decision required.

Agree the site, system and measurement boundary.

Review existing evidence and identify material gaps.

Select the appropriate audit, investigation, feasibility or verification scope.

Document deliverables, exclusions, responsibilities and decision dates.

Complete the assessment and identify the next practical action.

Carry assumptions and evidence into implementation and performance review.

Discuss an energy optimisation project

Contact Northmore Gordon with the facility, systems involved, current evidence and the decision your organisation needs to make.

What does Northmore Gordon's Energy Optimisation service page describe?

The page describes how we customise energy optimisation programs to suit each client's needs, built around three core actions: an Energy Audit, an Energy management system, and an Energy performance improvement plan.

What is the definition of Energy Optimisation given on the page?

Energy Optimisation simply means that your energy is being used in the most productive way possible and is not being wasted.

What are the three core actions of Northmore Gordon's energy optimisation programs?

The three core actions are an Energy Audit, an Energy management system, and an Energy performance improvement plan.

Does Northmore Gordon offer a standard, one-size-fits-all energy optimisation program?

No, we customise energy optimisation programs to suit each client's specific needs.

How does Northmore Gordon's six-stage delivery approach connect technical assessment with business outcomes?

The six stages—Assess, Build the Case, Capture Value, Deliver, Procure and Perform—connect technical assessment, commercial decisions and ongoing operational performance. Starting points depend on your current situation: a site with an audit can move to feasibility; a site without interval data may start with a metering plan; a business facing a reporting deadline should identify its entity boundary and available evidence first. The approach helps establish appropriate scope and preserve evidence for funding eligibility.

What scope of services does Northmore Gordon include within energy optimisation?

Beyond the core audit, management system and performance improvement plan, our energy optimisation services span utility benchmarking, forecasting and modelling, metering plans, renewable heat assessments, feasibility studies, project management, procurement strategy, and measurement and verification. Services are applicable to industrial facilities, commercial buildings and utilities, combining engineering assessment with implementation, funding and ongoing performance support.

What types of energy audits does Northmore Gordon provide, and how do they differ?

We provide Type 1, 2 and 3 energy audits with varying levels of detail. Type 1 is a basic overview; Type 2 includes more detailed assessment with financial evaluation; Type 3 is a precision assessment of a major subsystem with additional measurement. The audit should match your real decision: finding avoidable waste, ranking investments or examining a system before replacement. Scope, deliverables and outputs should be specified in the engagement; an audit type alone does not promise a construction-ready design or fixed-price equipment quotation.

How should energy optimisation projects prepare to demonstrate savings?

Our measurement and verification service establishes baseline conditions, measures implementation results and verifies energy savings from projects. The central question is what energy use would have been without the intervention under comparable operating conditions. Before committing to equipment changes, establish the project boundary, baseline period and operating variables needed to explain the effect being claimed. Planning measurement early—before installation removes baseline evidence—protects your ability to verify results and support funding claims.

How does Northmore Gordon help compare energy optimisation opportunities?

A comparison should state the operating problem, baseline, proposed intervention, dependencies, costs, savings basis, measurement approach and implementation risks. Use the same energy prices and production assumptions when comparing alternatives. Keep modelled payback separate from verified operating results. An opportunity register documents each measure's boundary, estimated energy effect, assumptions, dependencies, evidence quality and next decision. This supports prioritisation and ensures opportunities remain distinguishable from implemented and verified outcomes.

What preparation is needed to begin an energy optimisation engagement with Northmore Gordon?

Prepare a project brief describing your business decision, site details, available evidence and desired outcome. Include site locations, operating constraints, current project stage, energy data available and decision deadline. Identify which role can approve investigations, capital expenditure and implementation. Attach bills, interval data, production records or equipment summaries rather than waiting for perfect datasets. Clearly distinguish estimates from measured information. A project brief enables Northmore Gordon to establish an appropriate starting scope and scope for your situation.

How do we calculate simple payback on an energy project, and what does it leave out?

Simple payback divides the project cost by the net recurring annual savings. For a project costing \$240,000 that delivers \$60,000 a year in net recurring savings, the payback is \$240,000 divided by \$60,000, or 4 years. If a confirmed upfront contribution reduces your cost by \$40,000, the payback becomes \$200,000 divided by \$60,000, or 3.33 years. Simple payback ignores the time value of money and any benefits that continue after the payback point, so for material investments we use your company's required discounted cash flow and risk approach and show how the result changes under different assumptions. These figures are a worked illustration of the method, not a quoted outcome for any particular project.