

Energy Savings Formula

Canonical: <https://northmoregordon.com/case-studies/energy-savings-formula/>

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Case-study summary

This historical case study records the project, delivery approach and reported results behind Energy Savings Formula . It has been reorganised for clearer reading and linked to current Northmore Gordon guidance so the project evidence can be used without treating an earlier result as a present-day quote.

Evidence note: The source page is dated June 21, 2019. Figures, scheme names, equipment assumptions and client circumstances belong to that project period. Opportunities, targets and forecasts remain distinct from implemented or verified outcomes, and current eligibility should be checked before using the case as a new-project benchmark.

Project record

The Client

Koppers Carbon Materials and Chemicals (KCMC) operate a chemical manufacturing facility in Newcastle, Australia. The facility takes coal tar (a by-product from steel production) and refines it via distillation processes into several products, including pitch (used as electrode binder in Aluminium smelting), naphthalene, creosote, and carbon black feedstock.

The Work

The team at Northmore Gordon have been engaged by KCMC since 2007 to assist with the implementation of their energy management program, under our 'Virtual Energy Manager' partnership service.

Some of the services we have provided under this program include:

Energy Management Diagnostics

Definition of strategic energy objectives

Established regular monthly reporting of energy KPIs and targets

Facilitation of brainstorming sessions to harness ideas and staff input

Project identification and feasibility evaluation

Formalising energy action plans

Preparation of business cases for energy savings projects

Preparation of successful government funding applications for energy savings projects

Design and delivery of on-site energy management training

Annual National Greenhouse and Energy Reporting Scheme (NGERS) reporting;

Monitoring and analysis of utility meter data and site sub-meter data

Facilitation of monthly energy management team meetings to track and report of progress of energy initiatives and set actions, responsibilities and timelines for future activities

Outcomes

Through this Energy Management Program, Northmore Gordon has assisted KCMC to reduce their energy costs by almost \$1,500,000 per annum (33% reduction in total site energy usage).

Operates a major Newcastle facility refining coal tar into pitch, naphthalene, creosote, and other carbon-based products for industrial use.

Using the results for a new project

Start with the site's current operating profile, asset condition and business objective. Define the baseline, project boundary, variables that affect energy use and the evidence available before selecting a technology or incentive pathway. This makes the comparison auditable and keeps physical savings separate from grants, certificate revenue and other financial benefits.

For a comparable project, confirm current program rules and product requirements, document installation and commissioning, and plan post-project measurement early. Historical results can show what was possible in one setting, but they do not establish current eligibility, pricing, payback or emissions outcomes.

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What is the practical significance of KCMC's 33% energy reduction achievement?

KCMC's 33% reduction in total site energy usage represents a substantial operational improvement for a continuous-process chemical manufacturing facility. This magnitude of savings is significant because chemical processing typically involves energy-intensive distillation and heating operations with limited flexibility. Achieving this level of reduction demonstrates that systematic energy management—combining diagnostics, regular monitoring, feasibility evaluation, and structured project delivery—can yield measurable results even in energy-intensive industrial settings. The associated \$1.5 million annual cost reduction directly impacts the facility's competitiveness and operating margins.

How does Northmore Gordon's Virtual Energy Manager service differ from traditional energy consulting?

The Virtual Energy Manager service provides ongoing partnership engagement rather than project-based consulting. It combines initial diagnostics and strategic planning with continuous monitoring, regular reporting, and facilitated team meetings to drive persistent performance improvement. This approach addresses energy management as an operational discipline requiring sustained attention—establishing monthly KPI reporting, coordinating action plans, providing staff training, and maintaining accountability through regular review meetings. For KCMC, this created an integrated program spanning energy audits, feasibility studies, business case development, and funding applications rather than treating these as separate engagements.

Why is monthly energy KPI reporting essential for industrial energy management?

Monthly reporting creates visibility into actual energy performance trends and enables rapid identification of anomalies or deterioration. In manufacturing facilities like KCMC's, where production processes are continuous and energy-intensive, monthly tracking allows comparison against targets, normalisation for production volume changes, and prompt investigation of unexplained cost increases. Regular reporting also supports accountability by assigning responsibility for specific metrics and creates a structured agenda for management team meetings. This operational discipline—distinct from annual reporting obligations—is a foundation for maintaining achieved savings and identifying new improvement opportunities.

How does energy management diagnostics support the business case development process?

Energy diagnostics establish the baseline condition, identify specific improvement opportunities, quantify their scale and business context, and surface implementation dependencies and risks. Our diagnostic work with KCMC identified concrete projects worthy of investment by separating real opportunities from speculative ideas. Formal diagnostics then support business case development by providing the technical evidence, cost assumptions, and savings estimates needed for capital approval. This structured approach reduces investment decision uncertainty and enables management to compare energy projects against other competing uses of capital on a consistent, evidence-based foundation.

What role do government funding applications play in the energy management program outcomes?

Government funding can materially improve project economics, enabling investments that might otherwise be deferred or rejected on internal rate-of-return grounds. We assisted KCMC in preparing successful funding applications, which suggests that available grants or incentives (such as NSW Energy Savings Scheme or Victorian Energy Upgrades) supplemented the project's business case. Funding applications require specific evidence standards, timing compliance, and accurate project definition—areas where specialist support reduces application risk. However, funding should never be assumed without scheme-specific verification of eligibility, and the base business case should remain viable without unconfirmed support.

How do sub-meter data and utility monitoring contribute to verifying energy savings?

Sub-meter monitoring isolates energy consumption for specific equipment, systems, or production lines, enabling attribution of savings to particular projects and detection of performance deterioration. For KCMC's distillation facility, sub-metering allows baseline establishment before equipment changes and measurement of actual post-implementation performance under comparable operating conditions. Utility-level monitoring tracks total site consumption and cost performance. Together, these data streams support both operational management (identifying daily or weekly anomalies) and verification of savings claims for reporting or certificate purposes. Regular monitoring and analysis is a discipline we maintained through the partnership engagement rather than a one-time project measurement.

Why is baseline definition critical to demonstrating energy savings from industrial projects?

A clearly defined baseline—representing energy consumption under specified operating conditions before intervention—is the reference point for calculating savings. In manufacturing, production volume, feedstock properties, ambient conditions, and operating hours all affect energy consumption. Without normalising the baseline for these variables, comparisons become unreliable. Our involvement in establishing baselines, measurement boundaries, and comparable operating assumptions ensures savings claims can be defended and verified. This is particularly important for KCMC if savings are reported under NGERs, used to support future funding applications, or communicated to stakeholders—each context requires evidence integrity.

What is the relationship between on-site energy management training and sustained performance?

Energy savings from equipment upgrades can deteriorate over time if operations staff are not trained on new equipment capabilities, control logic, or optimal operating procedures. On-site training ensures staff understand energy-relevant aspects of their roles, recognise abnormal operation, and know how to report issues. For continuous-process facilities like KCMC's distillation plant, this knowledge directly affects whether energy-efficient systems deliver their designed performance. Training also builds internal capability, reducing reliance on external advisors for routine performance monitoring and supporting the client's transition to sustaining improvements independently after the consulting engagement concludes.

How does NGERS reporting integrate with energy management project outcomes?

NGERS requires facilities above the 25,000-tonne CO₂-e or 100 TJ threshold to report annual greenhouse gas emissions and energy consumption. KCMC's facility, as a significant industrial operation, likely meets these thresholds. Energy management projects that reduce consumption also reduce reported emissions, directly benefiting regulatory compliance and public reporting. Our annual NGERS reporting service ensures project savings are accurately documented in the required format and timeframes. This integration links operational energy management to corporate emissions reporting, creating accountability across the organisation and supporting any public sustainability commitments or investor communications.

Why should energy savings from different projects be calculated separately rather than combined?

Multiple projects implemented at different times, in different systems, and under different operating conditions have distinct baselines, measurement boundaries, and implementation dates. Combining savings without documenting each project separately obscures which interventions were most effective, hides interactions or dependencies between measures, and creates difficulty in verifying outcomes or troubleshooting underperformance. Our practice of maintaining opportunity registers and separate project documentation for KCMC preserved this clarity. Separate tracking enables management to assess project performance, learn from successes and underperformance, and rank future opportunities on comparable evidence.