

Energy Model - Northmore Gordon

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An Energy Model is a mathematical model describing the energy use profile before implementation of a project (baseline phase) and after implementation of a project (operating phase) occurs. It establishes representative pre-project conditions and defines how changes in operating conditions will be treated in measurement and verification analysis. Energy models support business case development, opportunity comparison, and demonstration of what changed as a result of implemented projects.

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What is an Energy Model as defined by Northmore Gordon?

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What are the two phases described by an Energy Model?

An Energy Model describes the baseline phase, which is the energy use profile before implementation of a project, and the operating phase, which is the energy use profile after implementation of the project. The baseline establishes the reference standard against which project outcomes are measured. The operating phase reflects actual or projected energy consumption after improvements are made, allowing comparison to quantify savings and verify the effect of energy efficiency interventions.

How does an Energy Model support measurement and verification?

An Energy Model is central to measurement and verification by establishing the baseline conditions and defining the analysis boundary, data sources, and calculation methodology. The modelling approach must be established early in the process to determine what energy use would have been without the intervention under comparable conditions. By comparing modelled baseline consumption against post-project actual consumption, M&V; demonstrates credible savings and ensures accountability for energy efficiency investments.

What inputs are typically required to develop an Energy Model?

Developing an Energy Model requires energy history of at least one year, including electricity and fuel consumption records; interval data from meters; production volumes and operating schedules; equipment information and capacities; process profiles describing operational requirements; and documented changes in site conditions. The model should disclose production assumptions, energy prices, maintenance implications, and conditional funding. Clear distinction between measured data and estimates is essential for credible baseline establishment.

Why is the modelling approach important in energy projects?

The modelling approach determines how pre-project and post-project energy consumption will be calculated and compared. It must be established early in the process to ensure consistent treatment of operating variables, weather effects, production changes, and other relevant factors. Different modelling approaches can produce different savings estimates from the same raw data. Transparency in methodology allows project teams and reviewers to understand assumptions and verify that the analysis supports informed investment decisions.

How should operating conditions be treated in an Energy Model?

An Energy Model must define how changes in operating conditions between the baseline and reporting periods will be treated through documented adjustments. If production increases, operating hours change, or weather varies significantly, the model should account for these differences to isolate the effect of the energy improvement. This prevents lower bills from being misinterpreted as project success when they actually result from reduced production or changed operations rather than equipment efficiency gains.

What is the relationship between a Financial Model and an Energy Model?

An Energy Model provides the technical foundation for a Financial Model by quantifying projected energy savings. The Financial Model then discloses production assumptions, energy prices, maintenance implications, and conditional funding to calculate payback, return on investment, and other financial metrics. The Energy Model's baseline and savings estimates must be clearly stated and defensible before financial analysis converts them into business-decision metrics for investment approval.

How does Northmore Gordon use Energy Models in its delivery approach?

We use Energy Models across multiple delivery stages. During the Assess stage, forecasting and modelling identify opportunities and baseline conditions. In Build the Case, models support feasibility studies and investment case development. During Deliver, models establish measurement boundaries and baselines for M&V.; The modelling approach connects technical assessment with commercial decisions, ensuring that identified opportunities have credible evidence before implementation and can be verified after completion.

What distinguishes an engineering estimate from a verified Energy Model result?

An engineering estimate is a modelled expectation developed before or during project design based on assumptions about equipment performance and operating conditions. A verified Energy Model result is an outcome supported by actual post-implementation data, measurement records, and an agreed M&V; methodology. In NSW under PIAM&V; or Victoria under VEU rules, only verified results meet scheme requirements for certificate eligibility. Treating forecasts as achieved savings creates false confidence in investment returns.

Why should Energy Model assumptions be documented separately from results?

Documenting assumptions separately from results allows project teams and reviewers to understand what could change the outcome. Key assumptions include production levels, operating hours, energy prices, weather patterns, and equipment performance. Transparent documentation enables sensitivity

analysis—showing how results change if assumptions prove incorrect. This supports better decision-making by making explicit what uncertainty exists and which variables most affect the business case or savings estimate.