EEC Energy Efficiency Scenario Modelling

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Publication context: This article reflects its publication date. Market prices, program rules, reporting duties and deadlines may have changed. Confirm current official guidance before making a decision.

Read the 36-page Energy Efficiency Scenario Modelling report (PDF) .

Reporting and compliance context

Confirm the reporting entity and period, current thresholds, regulator guidance, evidence boundary and assurance obligations before applying the dated discussion to a live report.

Related guidance

Carbon advisory

Scope 1, 2 and 3 emissions

Contact us

Read the original article for the source publication and its full context.

What are Australia's carbon reduction targets and what is their significance for businesses?

Australia faces a 2030 carbon reduction target of 43% below 2005 levels and must achieve net zero by 2050. These targets require rapid deployment of all available abatement opportunities across the economy. For businesses, this means carbon management and energy efficiency are no longer optional considerations but essential strategic priorities. Organizations need to understand their current emissions profile, identify reduction pathways, and prepare transition plans. We assist businesses with emissions inventories, opportunity assessment, and transition planning to align operations with these regulatory and market-driven requirements.

What is energy efficiency scenario modelling and why does it matter for carbon transition planning?

Energy efficiency scenario modelling is a technique for forecasting how different efficiency improvements, technology changes, and operating adjustments will affect energy consumption and associated emissions over time. It allows organizations to compare alternative pathways, understand dependencies between measures, and evaluate the financial and operational impact of different transition strategies. Rather than treating opportunities in isolation, scenario modelling connects technical feasibility with commercial viability and timeline constraints. This approach is particularly valuable for businesses facing emissions reporting deadlines or developing net-zero transition plans, as it demonstrates how individual projects combine to achieve strategic targets.

How does scenario modelling support investment decision-making in energy efficiency projects?

Scenario modelling enables organizations to compare the outcomes of different investment sequences and operating strategies under various assumptions. By modelling scenarios with and without conditional funding, different energy prices, and alternative technology options, decision-makers can understand which factors most influence project returns and identify robust strategies that work across multiple plausible futures. This approach separates engineering feasibility from commercial viability and helps prioritize capital allocation across multiple sites or opportunities. We use forecasting and modelling as part of the 'Build the Case' phase, helping clients develop business cases that reflect realistic operating conditions and financial assumptions.

What role does scenario modelling play in water utility energy management?

Water utilities typically operate across many sites with diverse equipment, operating constraints, and service requirements. Scenario modelling helps utilities understand how efficiency improvements across their portfolio will accumulate to support emissions targets and budgets. It can reveal which sites or systems offer the highest impact, identify interdependencies between projects, and support investment sequencing across asset replacement cycles. For utilities implementing energy management systems and pursuing emissions roadmaps, scenario modelling connects facility-level assessments to corporate-level targets. Our work with regional water corporations includes energy assessment across multiple high-energy sites, generating data that informs portfolio-level scenario analysis.

How does scenario modelling address uncertainty in energy efficiency projects?

Efficiency projects depend on assumptions about operating hours, production levels, energy prices, equipment performance, and maintenance costs—many of which are subject to change. Scenario modelling tests how results would change if key assumptions vary, revealing which uncertainties matter most to the investment decision. For example, a project's payback might be sensitive to energy-price assumptions but relatively insensitive to small variations in equipment cost. This sensitivity analysis helps organizations understand project robustness and identify which uncertainties warrant further investigation before commitment. Our investment case guidance recommends presenting alternatives 'with and without conditional support' to ensure management understands decisions under realistic scenarios.

What data and evidence does scenario modelling require to produce credible results?

Effective scenario modelling requires baseline energy data (bills, interval metering, or sub-metering where available), production or operating information that explains energy consumption patterns, accurate capital cost estimates, and documented operating constraints. The modelling must distinguish measured historical data from estimates and engineering forecasts. Operating schedules, seasonal variation, and any planned production changes must be incorporated to avoid misleading comparisons. Our 'Assess' phase—comprising energy audits, utility benchmarking, and metering—establishes this evidence foundation. Without reliable baseline data and clear operating context, scenarios become speculative rather than credible planning tools.

How does scenario modelling support compliance with emissions reporting obligations like NGER?

NGER and other emissions reporting frameworks require organizations to track and report scope 1, 2, and 3 emissions against defined thresholds and periods. Scenario modelling helps organizations forecast how proposed efficiency improvements and technology transitions will affect future reported emissions, supporting compliance planning and target-setting. It also helps identify which operational changes or facility changes might affect reporting boundaries or methodology. For organizations subject to the Safeguard Mechanism or preparing NSW Climate Change Mitigation and Adaptation Plans, scenario modelling connects technical opportunity assessment to regulatory reporting requirements. We provide both emissions inventory support and opportunity assessment services that feed scenario planning.

What is the relationship between scenario modelling and the Northmore Gordon delivery approach?

Scenario modelling is a key tool within the 'Build the Case' stage of our six-stage delivery approach. After the 'Assess' phase establishes baseline evidence through audits and metering, scenario modelling synthesizes that information to evaluate technical and commercial viability of alternatives. It supports feasibility studies, strategy development, and investment case development. The outputs of scenario modelling—understanding which opportunities are viable, in what sequence, under what conditions—inform the subsequent 'Capture Value' phase where funding and certificate eligibility are assessed. Modelling thus bridges assessment evidence and commercial decision-making.

How can scenario modelling help organizations prepare for renewable energy transition in their energy strategies?

Scenario modelling allows organizations to forecast how efficiency improvements affect electricity demand, which in turn influences renewable energy procurement needs and costs. By modelling scenarios where efficiency measures reduce demand, paired with scenarios introducing solar generation, battery storage, or renewable electricity procurement, organizations can understand the combined effect on emissions, costs, and grid interaction. This supports evidence-based renewable energy strategy development aligned with net-zero targets. Our moREnewable100 service and moreData platform provide supporting tools for renewable procurement and emissions accounting, which work alongside scenario planning to support integrated decarbonization strategy.