

Metro Trains Comeng Fleet Lighting Upgrade

Canonical: <https://northmoregordon.com/case-studies/metro-trains-on-track-to-energy-efficiency/>

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Metro Trains replaced fluorescent lighting across 136 Comeng train units as part of a fleet life-extension program. Wattly and Northmore Gordon supported equipment approval, measurement and verification, and the Victorian Energy Upgrades project-based activity process over almost three years.

Evidence note: The source case study was published on 25 November 2020. Fleet, operating, dollar, emissions and certificate figures reflect that historical project period and should not be treated as current Metro Trains data or a forecast for another transport operator.

Project context

The project aimed to reduce energy and maintenance demand while improving lighting consistency and keeping trains available for service. A fleet-scale claim also required a defensible way to use measurements from a subset of train sets.

Northmore Gordon's role

Worked with Metro Trains and TTM Rail to support approval of specialised train lighting under VEU.

Developed a sampling and measurement and verification approach for fleet-wide savings.

Managed evidence through multiple stages of the project-based activity method.

Supported certificate registration and payment.

Sampling can reduce measurement burden, but the sample must represent the fleet, operating conditions and equipment configurations. The expansion method and uncertainty should be documented before results are extrapolated.

Reported project results

Train units upgraded: 136 Comeng units

Lights replaced: 14,100

Reported annual energy saving: about 2,000 MWh

Reported annual carbon abatement: about 2,200 tCO₂-e

Reported annual operating saving: about \$200,000

Reported certificate value: \$570,000

Reported payback: less than one year

The source reports a 95% reduction in lighting-maintenance cost.

More consistent lighting and improved reliability helped keep trains in service.

Removed fluorescent tubes were recycled, including management of their mercury content.

What this project shows

Transport assets add operational constraints that a building retrofit may not have: rolling-stock approvals, safety, standardisation, maintenance windows and representative duty cycles. The evidence plan needs to match those constraints.

A current project should verify the scheme method, product requirements and baseline rules before procurement. Historical certificate values do not establish present eligibility.

Related guidance

Commercial lighting

Measurement and verification

Government schemes

Environmental certificates

What to do after an energy audit

More case studies

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

Why did Metro Trains Melbourne choose to upgrade lighting on its Comeng train fleet?

Metro Trains faced high maintenance overheads from its existing fluorescent lighting system and sought to extend the operational life of its Comeng train fleet. The LED replacement addressed both challenges: it reduced maintenance costs by 95% through more reliable and durable lighting, while the life-extension work kept the trains in service until potentially 2027 and beyond. The upgrade also improved passenger experience with uniform lighting levels and colour throughout all carriages, demonstrating how operational constraints and efficiency improvements can align within a structured investment.

What measurement approach did Wattly and Northmore Gordon use to verify savings across the entire Comeng fleet?

Rather than measuring every train unit individually, Wattly and we employed a sophisticated sampling measurement and verification approach. They measured a representative subset of the 136 upgraded Comeng train units and used those results to calculate verified savings for the entire fleet. This proportionate methodology reduced verification costs while meeting Victorian Energy Upgrades project-based activity standards, demonstrating how appropriate M&V; design can balance evidence rigour with practical project economics.

How did the project navigate Victorian Energy Upgrades requirements for specialised train lighting equipment?

The LED lighting specified for the Comeng trains was specialised equipment not covered by standard prescribed activities under Victorian Energy Upgrades. Wattly and we worked through the Project Based Activities (PBA) methodology to gain approval for the custom lights, ensuring each stage of the VEU program met regulator standards. This required technical assessment, commercial documentation and measurement planning tailored to rail-fleet operating conditions, illustrating how complex projects require early engagement with scheme requirements.

What were the financial and operational outcomes of the Metro Trains lighting upgrade?

The project achieved approximately 2,000 MWh of annual energy savings and 2,200 tCO₂e of annual carbon abatement, generating \$200,000 in annual operating expense savings. The Project Based

Activities methodology created \$570,000 in Victorian Energy Efficiency Certificate value, resulting in a payback period of less than one year. This combination of energy, maintenance and certificate benefits demonstrates how structured efficiency projects can deliver rapid financial returns alongside emissions reductions and operational improvements.

Why was certificate value important to the Metro Trains business case?

The \$570,000 in Victorian Energy Efficiency Certificate proceeds significantly accelerated the project payback to less than one year, making the investment commercially attractive and justifying capital allocation. Without the certificate contribution, the business case would have relied solely on energy and maintenance savings. This illustrates why early engagement with scheme eligibility and certificate assumptions is essential: the financial viability of infrastructure upgrades often depends on treating energy certificates as a distinct and verified revenue line, separate from operational benefits.

How did the fluorescent-tube disposal element add value to the sustainability case?

The upgrade removed more than 14,000 fluorescent tubes from service, enabling proper recycling of the small amounts of mercury they contained. This environmental benefit complemented the energy savings and carbon abatement, demonstrating how modernisation projects can address multiple sustainability objectives. Proper end-of-life management of the replaced equipment reduced environmental impact and supported compliance with waste and chemical regulations, adding a compliance and reputational dimension beyond energy performance.

What does the Metro Trains case illustrate about applying Victorian Energy Upgrades to transport infrastructure?

The Comeng project demonstrates that Victorian Energy Upgrades methodologies can address large-scale, specialised infrastructure where standard prescribed activities do not apply. Project Based Activities allowed custom technical design, proportionate measurement approaches and specialised approval pathways. The three-year engagement timeline reflects the complexity of coordinating with operating constraints, multiple contractors and regulator approval stages. This case shows how structured energy-project frameworks can be adapted to asset-intensive, safety-critical operations when measurement, eligibility and commercial arrangements are planned from the outset.

How can transit operators assess lighting upgrades for energy and certificate eligibility?

Transit operators should start by defining their operating requirements: lighting performance standards, maintenance constraints, vehicle life-extension goals and production schedules. Document existing energy consumption and maintenance costs by train unit or fleet subset. For specialised or custom equipment not covered by prescribed standards, engage early with a scheme advisor to confirm Project Based Activities eligibility, measurement approach and evidence requirements. Establish project timeline, approval dependencies and certificate assumptions before finalising equipment specifications, ensuring the business case reflects both verified energy savings and realistic certificate proceeds.