

Developing Energy Targets for Education Laboratories

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Throughout the world a number of energy rating schemes exist to allow designers and owners to compare a building's energy use against an established target. The target is then benchmarked against other buildings based on geographic location and energy type.

Australia has rating schemes for office, educational, retail, healthcare, mixed-use and industrial facilities, but not for biological and chemical-based research laboratories. However, the US-based Labs21 program and the UK's HEEPI initiative aim to set benchmarks for laboratory design, construction and operational management, with the HEEPI scheme designed around higher educational facilities.

This work was designed to develop energy targets for a proposed tertiary education and government research laboratory in Brisbane, Australia, now in construction. The work is based on high-level energy audits of six similar facilities in the region and takes into account international laboratory benchmarks and other Australian energy benchmarks.

The audits found there was a reasonable correlation between the different sites in terms of energy usage for various area utilisation types. Correlations between the various sites predicted energy usage and actual utility billing information ranged from 81-112 per cent.

These energy benchmark figures were applied to the proposed research laboratory's space schedules to estimate total annual energy consumption. By redeveloping best practice figures from comparable facilities using other energy benchmark tools, it was estimated that the proposed research laboratory's energy target should be reduced by 28 per cent. The design has been implemented based on these targets.

Using these targets and other design energy benchmarks during the design process will greatly assist the project team in achieving the client's objective of an energy efficient facility.

An expansion of the benchmarking work is now proposed to enable compilation of wider laboratory energy data from throughout Australia and New Zealand, including additional facility types and climate zones. This work will allow region wide comparison with international benchmarks and best practice in assessment of existing laboratory energy performance and in the design of new facilities...

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