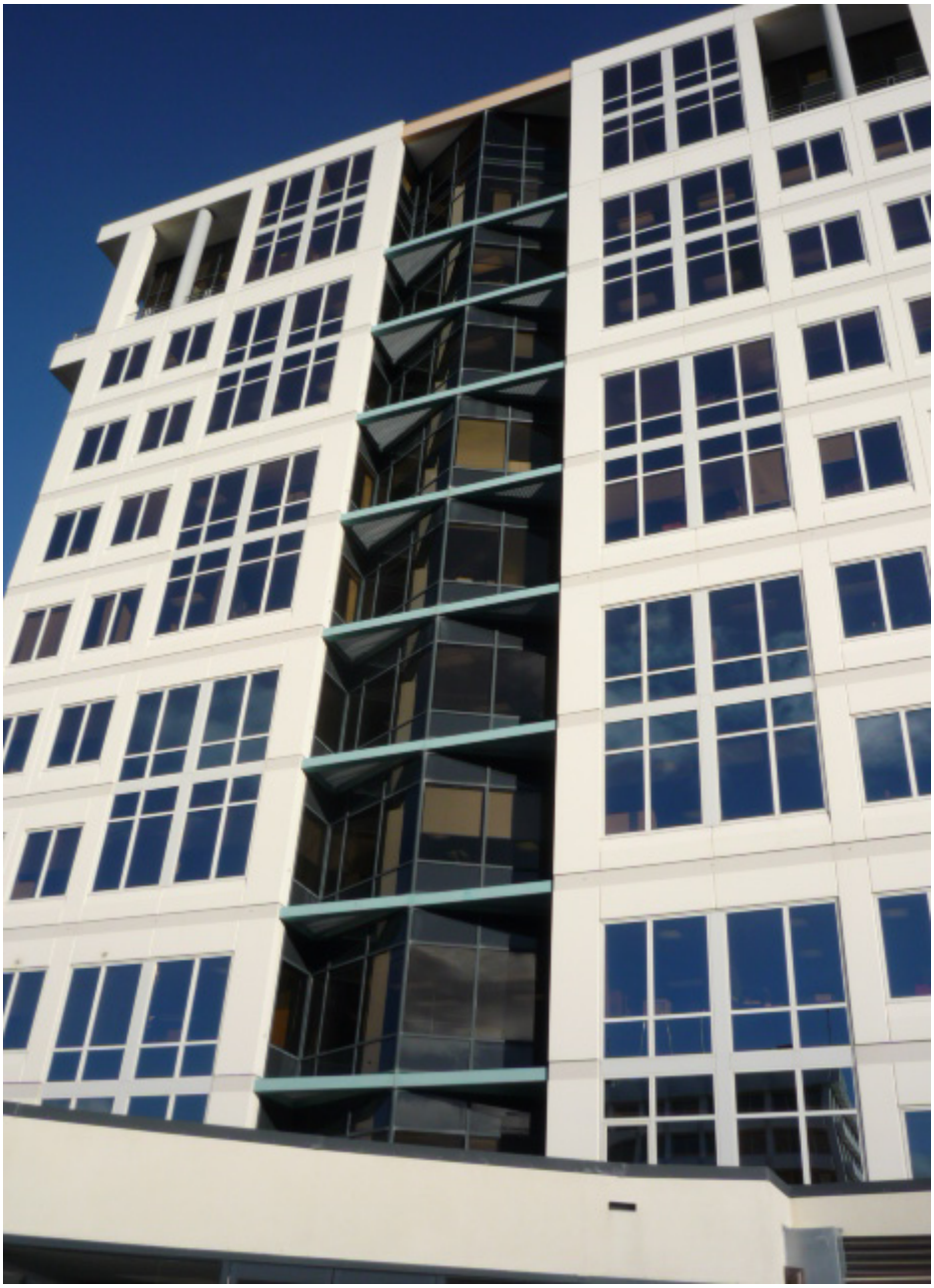
PRODUCT PROFILE

Continuous Energy Optimisation^{eco}



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eco SYSTEMS
SAVING ENERGY AND THE ENVIRONMENT

What is Continuous Energy Optimisation?

Continuous Energy Optimisation is a process of observation, measurement, analysis and verification to track energy usage in buildings in order to identify problems with lighting, heating, ventilation, air conditioning (HVAC) control, and problems with plant and equipment with the long term objective of achieving optimum building energy efficiency.

High level analysis of building energy use requires specialised skills and experience in lighting, cooling, heating and refrigeration, mechanical engineering, electrical power and distribution, motor control, data and communications, automation and control, statistics and data analysis. The Continuous Energy Optimisation process must be performed by experienced professionals in the building services and maintenance industry.

As an approach, Continuous Energy Optimisation has gained attention within the global energy efficiency sectors for its association with significant long term reductions in energy consumption. The term implies that the approach is an ongoing process rather than an event. Energy optimisation in this case refers to the optimal set up and configuration of building systems and services.

ECOsystems works with corporate and government clients, landlords and tenants in commercial office and institutional buildings to fine tune the building plant to minimise energy use while maximising comfort, security and financial return.

The Process

The Continuous Energy Optimisation process examines every aspect of how energy is used and controlled in a building.

The ECOsystems process incorporates careful observation, data gathering, assessment and analysis, planning and implementation with the goal of achieving a high level of lighting and HVAC performance, occupant comfort and energy performance.

The process begins with a detailed site survey and energy balance followed by a comprehensive analysis of the operation of the building's physical plant. Energy pathways and metering systems are mapped.

A plan is then developed to measure and verify savings.

Once this information has been prepared, energy tariffs and line charges are reviewed, existing plant, equipment and controls fine tuned and energy conservation measures (ECMs) identified.

While the process typically identifies low and no cost energy conservation measures such as modifying the BMS control strategy, larger capital cost ECMs are also identified. Clients are expected to implement ECMs with a payback of two years or less.

ECOsystems then works with our partners to obtain funding to perform the ECMs and offers to project manage the implementation before measuring and verifying the results to the International Performance Measurement and Verification Protocol (IPMVP) standard.

Measurement and Verification

Measurement and Verification (M&V) is one of the most essential components of the Continuous Energy Optimisation process. M&V is a methodical and scientific process which leads to the best available metric for ECMs. With M&V all the estimates, modelling and spreadsheet calculations are removed and what is left is the actual energy savings. It provides the answer to "did we get the results we thought we were going to get with the ECMs?" and "were the ECMs financially viable?".

ECOsystems performs M&V according to the internationally recognised standards outlined by the International Performance Measurement and Verification Protocol (IPMVP). IPMVP allows building owners, tenants and financiers of energy efficiency projects to quantify the energy savings and the return on their investment.

Ongoing M&V allows issues to be resolved when they arise rather than in five years when the site is next audited and acts as an insurance policy to ensure energy savings are retained.

Strategic Investment

Energy efficient upgrades save you money that can be used to pay for the cost of projects. Crucial business decisions involve the weighing up of capital costs versus continuing increases in operating costs for energy. Strategic investment in energy efficiency provides a hedge against the certainty of higher energy costs.

The quickest and most obvious way to lower energy costs is to first use low or no cost options such as lowering lighting levels and turning HVAC and other equipment off when not required and to purchase more efficient equipment. For small, inexpensive projects, in order to keep the payback low and return on investment high, these projects can be internally funded. Even a longer return on investment in energy efficiency results in affordable comfort, and new more reliable equipment that will pay for itself with energy savings and lower maintenance costs.

Access to capital for an energy efficiency upgrade need not be an issue. For larger projects, financing might be the only way

to pay for the upgrade. For those that do require investment, there are traditional and non-traditional financial resources available.

ECOsystems can help you look at various types of funding available for your upgrade. A well designed energy efficiency upgrade can provide your business with a positive cash flow from energy savings while paying off the capital investment.

Tenants and Landlords: The Split Incentive

Often potential difficulties arise when two parties engaged in a contract have different goals and there are differences in the levels of information. The landlord's goal is to maximise the return on investment by maximising revenue (rent) and reducing expenses, while the tenant's goal is to maximise staff comfort and reduce operating expenses (rent, power).

This difference in goals is often referred to as the landlord-tenant problem or split incentive.

With the split incentive, depending on the type of lease, either the tenant or the landlord (but not necessarily both) will reap the rewards of Continuous Energy Optimisation. With a net lease the problem occurs because the landlord provides the energy infrastructure (such as heating and cooling systems), but the tenant pays the energy costs for these services. In this situation there is little incentive for the landlord to choose the most energy-efficient plant over the lowest capital cost plant. Similarly, with a gross lease there is no incentive for the tenant to be energy efficient as the landlord either gets hit with the cost or benefits because the lease payments remain the same.

Other than location, operating expense is the number one priority for a tenant, so if the landlord can show that the operating expenses paid by the tenant are less than an equivalent property, then the landlord can charge a higher rent without compromising the tenants overall occupancy costs.

As well as an increase in rent, other potential benefits for the landlord include leasing their buildings more quickly, with longer leases, to better tenants. For the tenant the benefit is lower operating expenses and increased comfort levels for staff.

The challenge is producing verifiable data and standards to use as a reference for both the tenant and the landlord when discussing rent and what value the building's energy efficiency provides in reduced operating expenses. Providing better quantifiable data to both the tenant and the landlord shows the economic benefits of efficiency for both parties.

Continuous Energy Optimisation overcomes these challenges by providing independent quantifiable data, measurement and verification to an international standard.

Better sharing of information means better decisions by the landlord and the tenant creating a more stable relationship that is beneficial to both.

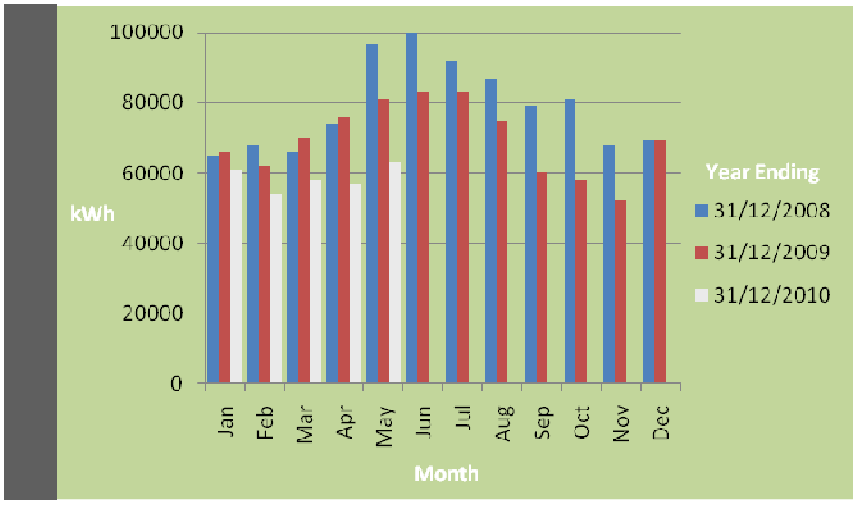
57 Wellington St Auckland

Key Benefits of CEO^{eco} for 57 Wellington Street

A three-storey glass and steel office block building in Auckland

- The elimination of 'fighting' between the heating and cooling systems has resulted in considerable energy savings.
- Approximately 20% energy reduction through chiller and cooling demand re-programming.
- Energy consumption baselines have been established in order to ensure these savings are maintained.
- Equipment life, in particular chillers, is enhanced by the reduction in their operating use.
- Reduced maintenance costs for landlord.
- A number of maintenance issues have been identified for future rectification.
- Perhaps most importantly for the building owner, tenant comfort has been enhanced and there has been a reduction in complaints.

A building's value is a function of the net rent. Overseas evidence shows that when assessing a building's capital value an increased value is attributable to energy efficient 'green' buildings. This trend is likely to occur in New Zealand as energy prices increase and more buildings are optimised to minimise energy use.



57 Wellington Street actual power consumption before and after CEO implemented from September 2009

Implement CEO at Fitout

Continuous Energy Optimisation during a tenant fitout can dramatically improve ongoing building energy performance without requiring significant additional capital cost. Rather than install the lowest cost plant and equipment which usually means ongoing increased expenditure on energy and maintenance, the CEO process will identify the cost and benefits of more efficient lighting and air conditioning to enable a more informed decision. It also provides the facts necessary to work with the landlord on the most efficient control strategies for the buildings plant and equipment.

Gross and Net Leases

In the example below, the total occupancy cost for the tenant under a gross lease remains $2.0m/pa but the capital value has increased by 18.5% giving the landlord $2.77m capacity for an energy efficiency upgrade as a result of implementing CEO. **Note** The cap rate is reduced because the building is more easily tenanted and more likely to retain tenants as a result of CEO.

Gross Lease Example:

Building Value Pre-CEO $15m

Rental Income	$2.0m/pa
Opex	$0.5m/pa
Net Income	**$1.5m/pa**
Cap Rate 10%	$15.0m value

After-CEO

Rental Income	$2.0m/pa
Opex	$0.4m/pa
Net Income	**$1.6m/pa**
Cap Rate 9%	$17.78m value

In the example below, under a net lease and after Continuous Energy Optimisation, the tenant has $100,000/pa available to spend on Continuous Energy Optimisation and ECM implementation.

Net Lease Example:

Pre-CEO

Rental Income	$1.5m/pa
Opex	$0.5m/pa
Net Income (Landlord)	**$1.5m/pa** Tenant TCO $2.0m/pa

After-CEO

Rental Income	$1.5m/pa
Opex	$0.4m/pa
Net Income (Landlord)	**$1.5m/pa** Tenant TCO $1.9m/pa

TCO = Total Cost of Occupancy

In this example, a tenant on a six year lease can invest $20,000/pa for Continuous Energy Optimisation and $50,000/pa for ECMs which provides a net cash flow benefit of $30,000/pa. Further benefits are increased comfort, satisfied staff and increased productivity.

Green Lease Example:

Where opex savings of $100,000 are produced, this could be shared between the Landlord and Tenant.

Tenant: $50,000 / $2.0m = 2.5% occupancy cost reduction and much better environment for staff to work in.

Landlord: $1.55m rental @ 9% (after upgrade) = $17.22m which is an increase in property value of more than $2.22m.

Another way for both the tenant and landlord to see the benefits of energy efficiency is by having a lease with green and energy efficiency clauses; so called ‘green’ leases.

With a green lease the more efficient the space the lower the tenant’s operating costs. While the landlord may potentially get less rent the operating expenses will be lower resulting in a higher net yield.

The ECO Conundrum 15-5-500-5,000

In a typical commercial building, the annual base build energy costs can be around $15/m2. We know a saving of 33% or $5/m2 is typically achievable.

Depending on the building use and location, tenants could be paying $500/m2 and staff costs typically are around $5,000/m2.

Clearly a landlord would not want to jeopardise a tenant paying $500/m2 for an energy saving of $5/m2 and a tenant would not accept any reduction in staff comfort levels.

From experience, ECOsystems has established that reducing the energy cost has not only reduced operating costs but also significantly increased tenant comfort which means tenants are retained and staff are more content.

As a result the value of the building is potentially increased.

SKYCITY Complex Auckland

Feedback from Jonathan Woodbridge Buys, Energy and Environment Engineer, SKYCITY Auckland:
“Substantial energy efficiency gains and energy conservation savings anticipated … is already changing SKYCITY Support Services Facilities Management strategy to embrace the principles of (CEO) from what has been learned from ECOsystems”.