



# ECO News



December 2000 Issue

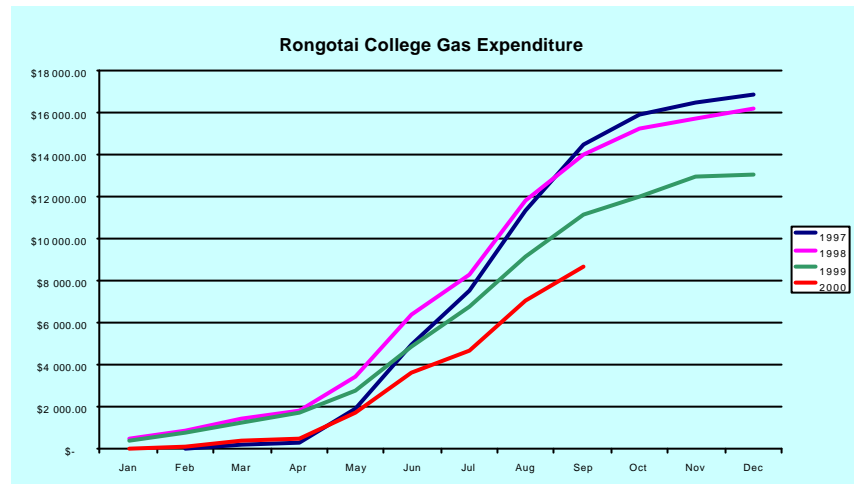
Published by ECOsystems Limited, 1<sup>st</sup> Floor, 46 Victoria Street, Lower Hutt, Wellington, New Zealand. PO Box 44-121, Lower Hutt, New Zealand  
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The team at ECOsystems wish all our clients a Merry Christmas and a happy and prosperous New Year. We hope that you enjoy the season and have a chance to relax and unwind - we know for most of you it has been another busy year.

## National Award



ECOsistemas was successful in conjunction with Rongotai College in winning a prestigious national Energy Wise award at the Energy Wise awards in Auckland in August 2000.



## Education Project Updates

### Naenae College

This project was completed during August 2000 and consisted of a Building Energy Management System (BEMS) to optimise the boilers and control the flow to individual blocks; a powerline carrier control system to manage the lighting and ensure all lights are turned off at the end of each spell; valve blankets, VendingMisers and more energy efficient lighting. Annual projected savings are more than \$28,000.00 per annum.

### Nelson College

This exciting project was carried out over the summer break and included a BEMS to control load shedding; a powerline system to control the lighting in each classroom; more efficient lighting, ECO GFX water to water heat exchangers in the dormitories to significantly reduce hot water costs; ceiling insulation and cylinder wraps. Annual savings are also expected to be around \$28,000.00 per annum.

### New Plymouth Girls'

Completed at the same time as a major redevelopment, this upgrade should achieve savings of around \$25,000.00 per annum. This project included a comprehensive upgrade of the kitchen ovens, decommissioning of the drying rooms and installation of dryers, ECO GFX water to water heat exchangers in conjunction with low flow showerheads, valve covers, more energy efficient lighting, a BEMS and a powerline control system to manage the classroom lighting.



## Independent Review of Energy Savings

During the year EECA engaged independent consultants to review three of our energy efficiency projects which had been installed for more than 12 months.

One of these projects showed savings at close to the level we had calculated, at another the savings were double our estimation and at the third there had been a complete change in the way energy was invoiced, and it was not possible to complete the comparison.

One thing that came out of the exercise is that, the more the energy was managed and the systems ECOsystems installed actively used, the greater the savings. As a result of this we are converting a number of systems to give more control at the local level.

## ECO GFX Water to Water Heat Exchanger

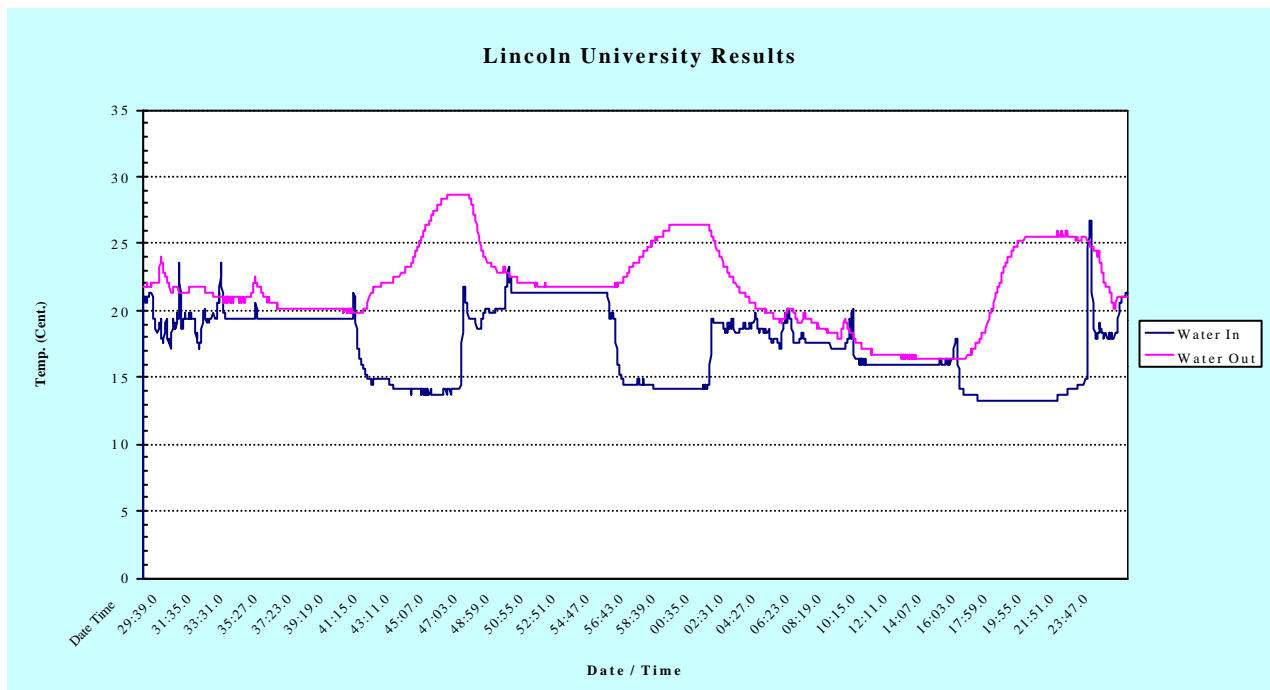
After successfully installing more than 100 of these water to water heat exchangers (which recover waste heat from the shower drain and halve the cost of showers) over the last 3 years, ECOsystems has obtained the Australasian rights from the US and is now successfully manufacturing them in New Zealand. ECOsystems has been able to get a number of units installed through the EECA Energy Saver Fund which provided a subsidy to prove the technology in New Zealand.

A recent installation at Lincoln University is typical of the responses we get. Rod Vardy of Lincoln University who organised the installation of a number of units in the student hostels, had this to say:

We have just completed tests on the 10 GFX heat exchanges that were fitted into five separate accommodation blocks housing 114 students here at Lincoln University.

The Installation was straightforward with only a small amount of extra materials needed to complete the job.

The results obtained were well beyond our expectations, an average increase of 13 degrees Centigrade to the cold water supply, and we have no hesitation in recommending these units to anyone for energy savings. The graph supplied is proof the savings are there.



Our first ECO GFX has been sent to Australia and we hope to manufacture in New Zealand for this market. We have also recently been asked by the inventor, to provide pricing for units to be sent back to the USA. Our weak currency makes it viable for us to manufacture here and export.



## Product Upgrades

Our powerline carrier products which enables us to send signals over the existing wiring to control energy, continues to be upgraded. A recent improvement is the new A10 protocol which has taken over from the old X10 protocol. The big advantage of this is the possibility for two-way communication. Whereas with X10, when we sent the signal there was no way of being sure that the message had been received, the A10 allows a signal to be sent back confirming the message has been received. This is a major improvement.

The new RS301 flush switch is A10 based and also operates at lower signal strengths for greater reliability. The new CR244 repeater/amplifier outputs signals at 6 volts rather than the previous 2V which also greatly improves reliability. And lastly, a new signal tester makes fault finding so much easier. It has a LCD screen which displays the signal strength, the noise on the line and the A10 codes being transmitted.

## Hotels

ECOsystems also provides 'energy efficiency reviews' in this sector. A recent study for a new hotel in Wellington, concluded there were a number of areas where substantial energy savings could be achieved. One of the features of this new development will be the integration of the Quantum heat pumps to provide the hot water, in conjunction with ECO GFX to recover the waste heat typically lost down the drain. By transferring this heat back into the Quantum's the efficiency of the hot water production is amazing. They will practically enjoy free hot water!

Combine the efficiency of this hot water system with a comprehensive BEMS and the payback will be less than 3 years at current energy prices. As energy prices begin to rise the payback becomes even less.

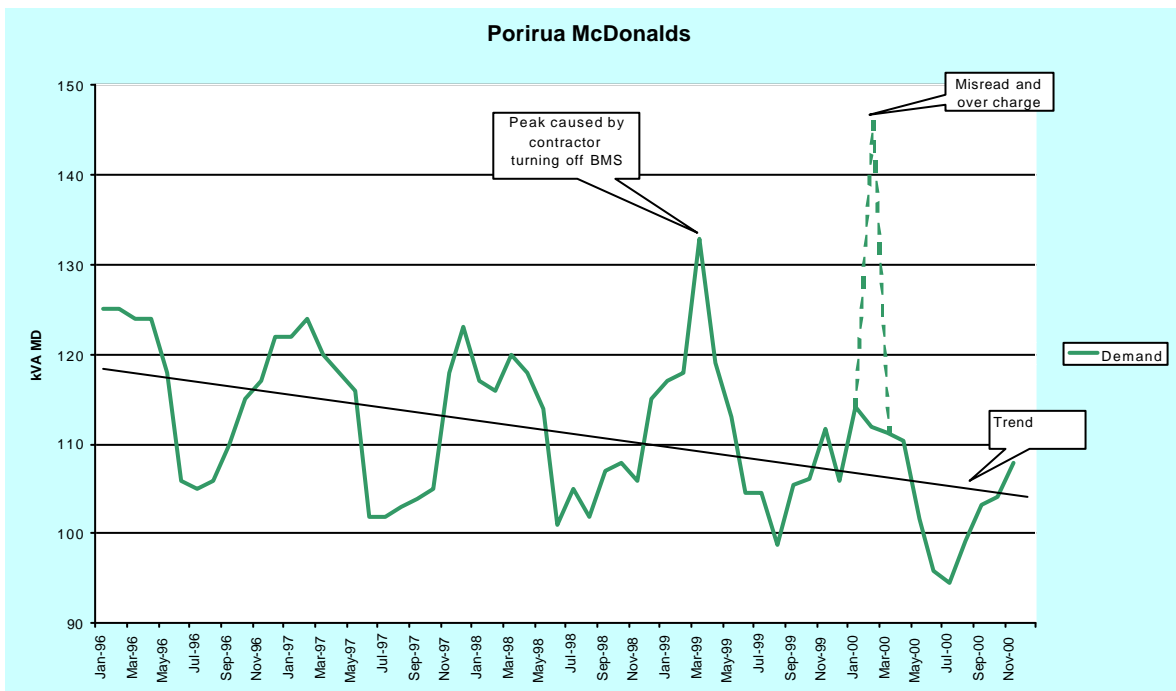


## Fast Foods



Our success at reducing energy consumption at fast food chains continues as the following graph demonstrates. Also note that twice in 6 months, the energy retailer invoiced the incorrect energy charges and we were able to obtain a refund for our client.

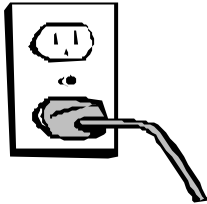
ECOsystems is installing Walker systems at another two fast food sites over the summer.



## Walker Systems

ECOsystems is delighted to advise our customers that we are now installing Walker products in New Zealand. Walker Systems based in Canada, have a full range of Building Energy Management Systems and have been operating in this field since 1985. We will be telling you more about these products in future newsletters.

## VendingMisers



***Do you have vending machines installed at your site?***

***Have you measured how much energy they use?***

Typically a vending machine can use in the order of \$200 - \$400 worth of energy per year. Our VendingMiser products from the U.S. have inbuilt fuzzy logic, which allows them to learn when the machines are typically used and, while maintaining the temperature of the drinks, turns the units off when they are not used to reduce energy consumption by around 50%. Some vendors have also found sales to increase as the vending machines light up when someone approaches!

## Rest Homes



ECOsystems continues to make substantial savings for rest homes and over the last 15 months we have installed energy efficiency upgrades at 12 rest homes.

At one recent installation, the energy retailer was having difficulty supplying adequate energy. Through the use of an energy management system we were able to reduce the load by managing the heating to significantly reduce energy costs and lines charges.

At another site where the boilers had difficulty coping with the amount of hot water required, installing water saving devices will not only reduce the gas usage of the boilers but also reduce water costs and make for happier residents.

Heat recovery in the laundry and showers, water efficiency measures, energy efficient lighting and energy management controls can make a substantial reduction in your energy charges for these sites.

## Education



A number of our clients are currently completing building projects and we encourage you to use our services to tie energy management and energy efficiency into these developments. ECOsystems offers a very cost effective 'energy efficiency' review of any proposed developments. While energy efficiency is often left to the architects to build in, our experience suggests that a combined approach can make substantial improvements.

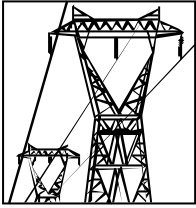
In two recent examples, sites where we had previously proven our services, asked that we overview new building plans. The integration

of ECOsystems recommendations has been approved and will ensure substantial dollar savings. We have also been able to tie the new buildings to the existing Building and Energy Management System which ensures that managing the energy use is easy and therefore more likely to be utilised.

Technology continues to become easier to use, more reliable, more cost effective and cheaper (apart from the US dollar issues). This means that sites which had energy efficiency upgrades even 3 years ago can upgrade their systems to make controls much easier to use and save even more money.



## Energy Prices



### What is happening with energy prices?

As we predicted in our last newsletter, we have recently seen the beginning of future price rises for energy now that the major restructuring in the industry has been played out. Any clients on 2 or 3-year contracts should, we believe, begin to budget for higher prices once their contracts expire.



### Who is offering the best energy prices?

We have found that this varies month to month depending on the strategy of the energy retailer at any one point in time. One retailer may be hungry for some months to get load but it is not long and another retailer is offering a better price. It is important in going to the market that you have a finger on the pulse as the differences can be quite surprising.

One factor we are pleased to report is that many of the backlogs are being worked through and we have been pleasantly surprised to find some retailers are getting their act together and have recently taken a more pro-active approach to helping their clients.

## Energy Terms

kWh is a measure of the energy consumed over a period of time. You pay in cents/kWh.

KW is a measure of the rate at which you are using that energy. Imagine times of the day when everything is running and the rate at which you are using energy is maximised. At other times of the day, some lights will be turned off and the air conditioning won't be working as hard and the rate at which you are using energy is reduced. This is also known as the 'demand'. You usually pay in \$/kW.

ECOsystems looks at reducing both the kWh and kW. This means reducing your energy costs AND your network or lines charges.

Some time ago we said we would explain the difference between kW and kVa (Kilovolt Amperes). Now is an appropriate time to do this as there are changes occurring in the network charges in some areas of the country. Both of these terms relate to a measure of the rate at which energy is being used, however kVa also takes into account the resistance and line losses on your site. It is a measure of the kW + this resistance and line losses – see 'office complexes' below.

## Office Complexes

There is a trend for larger sites that have previously had their line charges based on kW to now be charged on kVa. We have had two recent cases where we have been asked by clients to look at line charges because of this change. By installing data loggers we can measure the efficiency of your site and, if necessary, install Power Factor Correction (PFC) to ensure you do not incur expensive additional line charges.

These PFC units often have a payback of around 2 years or less.

## Saving Energy and the Environment

ECOsystems takes its responsibilities to save energy and the environment seriously and we thought you might be interested to know the kWh energy and carbon dioxide savings (CO<sub>2</sub>) from our projects which began in March 1995.

CO<sub>2</sub> savings 1,100.00 tonnes  
KWh savings 3,000,000

Even if big governments internationally can't get their act together to implement the Kyoto protocol, we'll be working with you to do our part!!

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As you know, ECOsystems is always looking for new energy saving products and something you will hear a lot more about in the future is GeoExchange. This basically works on the same principles as a heat pump (air conditioning) but instead of using the air to provide heat or cooling, it uses the earth. There are major advantages with this. On a hot day, a heat pump uses the air temperature to cool the refrigerant which circulates between the rooftop unit and the indoor unit which then provides the cooling in the room. Conversely on a cold day, the heat pump uses the heat in the air to heat up the refrigerant. While these units are very efficient, it is also obvious that cooling from air on a hot day and heating from air on a cold day is not ideal.

The advantage of the GeoExchange is that the liquid is laid out in tubes in the ground. Once you go a couple of meters below ground surface, the temperature is more or less a constant 17 - 19 degrees. This means that on a cold or hot day, the difference in temperature that needs to be made up or down is significantly less and therefore these units are even more efficient than heat pumps.

The GeoExchange is ideal for anywhere hot water is required as well as heating, or air conditioning is required 24 hours per day such as hospitals, rest homes, multi story residential homes or villages and large hotels and resorts.

The BIG advantages are lowest ongoing running costs, minimal noise levels, safety (no risk of Legionnaires Disease) and considerable space saving requirements in the plant room.

## **C-Bus Training**

Scott and Dave from this office recently attended a three-day C-Bus training session which should enable us to implement further energy savings in lighting systems for our clients.

C-Bus is a lighting energy management system which allows us to control groups of lights, schedule lighting by time, maintain a constant light level by, for example, switching off lights where there is a lot of natural light and, by integrating occupancy sensors, ensure lights are not left running when they are not required.

We propose to integrate this system with our Walker BEMS for optimal flexibility of all energy consuming devices.

### **Have you changed your email address?**

If you would like to receive our more frequent updates by email, or have changed your email address, please send us an email at: [econews@ibm.net](mailto:econews@ibm.net) with the word 'Newsletter' in the subject line and we will take care of the rest.

### **Next Newsletter**

We have lots to tell in our next newsletter! We currently have 17 energy efficiency projects in various stages of progress and look forward to sharing some of these with you in our next edition!

