

ECO News

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Saving Energy and the Environment | Intelligent Environments that Simply Respond

Happy New Year!

The team at ECOsystems wish all our valued clients a very Happy New Year. We trust that you had an enjoyable holiday season, and are recovering from the overindulgences that make Christmas so much fun. We wish you well for 2006 and hope you all enjoy health and prosperity.

Why not make a New Year's resolution now to become more energy efficient and enjoy better control of your environment.

Big Savings Through Energy Efficiency and Control!

ECOsysteMs' unique energy automation systems provide significant energy savings and simple automated control of your site.

We can integrate all proven energy efficiency measures into one project.

Winner of 5 National Energy Awards

ECOLite

In our last issue of ECO News, we introduced the new range of products from Intraco, including the ECOLite.

The ECOLite was tested at the BP Service Station at Melling, Lower Hutt, where we measured a 25% reduction in power consumption in the lighting system.

The ECOLite also extends the lighting elements lifetime, improves power factor and line transmission losses without any changes in the infrastructure.

ECOLites have now been installed in a number of restaurants around the country.



Single phase H.I.D. saver



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ECO Commercial Building Automation Projects

Wool House

Our BI team recently completed seven floors of this multi-storey building, installing C-Bus for energy management and control purposes. On the client's corporate level, we interfaced with AMX to achieve a high-level interface with the AV equipment. This was done in conjunction with Frank Millar & Co and URS.

Parliamentary Services

We are currently working on the Parliamentary Debating Chamber on The Terrace, installing a comprehensive lighting control system, in conjunction with Frank Millar & Co and Norman, Disney Young.

Logan Plaza

Becca Carter specified C-Bus as a control system for the Logan Plaza Shopping Mall in Upper Hutt. This is currently being installed and will consist of daylighting (lamps are dimmed when there is significant daylight to reduce energy use) and scheduling. The user interfaces will be via touch screens and PCs throughout the building.

WIAL

Wellington International Airport is currently upgrading the user interface for their C-Bus system. ECOsystems is installing Schedule Plus on their control PC as a front end for better control.

Other Commercial C-Bus Projects

Commercial Building Automation is our fastest growing business! Just a sample of recent projects include:

- Ministry of Foreign Affairs and Trade (MFAT)
- Ministry of Health
- CCMAU
- Pak n Save New Plymouth
- Briscoes at Wellington Airport
- Reserve Bank Gate Controls
- Reserve Bank Lighting
- Australian High Commission
- Crown Law lighting

AMP Building

ECOsysteMS is currently working with Stewart and Rogers Electrical and Norman Disney Young consultants on the installation of a C-Bus control system for energy management of the multi-storey AMP Building in Wellington City. The system utilises motion detection to obtain energy savings and scheduling via touch screens to maximise these savings. As with several other current projects, we are installing a control system into the corporate boardrooms which have removable walls. By monitoring (via micro switches) the doors position, C-Bus alters the rooms lighting control accordingly using the new Pascal logic controller.



Interface with Russound

As Systems Integrators ECOsystems continues to integrate separate systems so that control is simplified for you, the end user. Currently we are spending significant time working on integrating home automation with various sound, security and entertainment systems.

Clipsals' new colour touch screen for the C-Bus network allows us to develop applications that can interface with third party products via its RS-232 port.

Using the colour touch screen in-built PASCAL development environment, we have now developed a front end that interfaces with a Russound multi-room amplifier via Russounds own R-Net protocol!

This new development means you are able to control multi-room sound from the high resolution colour touch screen without the need for a separate controller just for sound.

We are also now developing a similar interface with Denon.



Wool House – our BI team are installing a high level interface with AMX

Tech Byte - Zigbee

Zigbee is a new standard of RF communications. It is a mixture of firmware and hardware. The hardware generally consists of a micro controller and an 802.15.4 radio. This is similar to Bluetooth, however the difference between Bluetooth and Zigbee is the way in which the radios are used. Bluetooth is used for short range, medium speed, and point-to-point communications. Zigbee sacrifices speed for reliability and power savings and has self-healing mesh networking, routing and encryption functions built in (the firmware side).

Currently the Zigbee steering committee is working on industry wide defined applications (profiles) for Zigbee based devices. The only one published at present is called "Home Lighting Control". One of the main ideas behind Zigbee lighting control is to have a battery powered RF light switch that is simply stuck to the wall where required - makes the wiring easy!

Because it is a wireless technology, installation costs should be reduced and because of the mesh networking it should be very reliable. In a mesh network if any individual unit fails to respond the message is re-routed via the next available unit.

ECOsystems is currently investigating the Control-4 range of lighting and home automation products - which include some Zigbee based products.

Lighting Industry Response to Consumer Article

Some of you may have seen the recent Consumer test report on integrated ballast compact fluorescent lamps (Consumer 452 October 2005 p36/37).

The Lighting Council NZ has expressed significant concerns about the nature and methodology of the test which has apparently raised many comments from their members regarding its appropriateness and rigour. In response the Council has sent a letter to Consumer raising their concerns. Just some of their concerns listed in the letter are:

- The test laboratory was unnamed (there are no laboratories in NZ accredited to carry out photometric testing)
- There is no mention of the test sample size.
- The test report states lamp light output as "lux" when the correct unit is "lumen"
- Lamp life was not part of the test however the report publishes the claimed life figures from the suppliers. This is dangerous and could be very misleading as different manufacturing cultures express lamp life in very different ways.
- The test report makes no comment about the very important area of legal compliance – CFL lamps need to comply with both electrical safety regulations and radio frequency radiation regulations and must be labeled accordingly.
- The test report makes no mention of the mercury content of the lamps which for obvious environmental reasons has been a topical issue.
- Two major operators in the CFL lamp field in NZ (and internationally) were not included in the evaluation – Sylvania and GE.
- The Christchurch lines company Orion provided funding assistance for the test. It seems unusual for a lines company to be involved in funding an apparently independent lamp test programme, however Orion is currently involved in a large joint venture CFL distribution programme with Ecobulb in the Canterbury region so they are not an impartial entity!
- The report is stated to cover nationally available products however the Ecobulb is not nationally available, whereas two national players (GE and Sylvania) have been ignored. This seems odd and appears to bend over backwards to accommodate one regional player. Could this possibly be linked to the source of funding?

The Lighting Council has offered their assistance to Consumers' Institute on any future lighting product evaluations!

Wind Power

Most New Zealanders are well aware of the benefits of wind power as a source of clean, green and renewable energy. New Zealand being located between the latitudes of 40° and 50° South enjoys an advantage when it comes to generating electricity through wind power as we are slap bang in the path of the "roaring forties" a predominantly westerly wind flow that is both strong and consistent.

In fact in some areas the problem is that there is too much wind rather than not enough! Modern wind turbine technology has many different designs ranging from turbines designed for low wind speeds up to wind turbines that have been recorded generating electricity in 165 km/h winds in Japan.

Before rubbing your hands together in glee there are some considerations to take into account. The first consideration is maintaining air flow through the wind turbine and the two main factors are height and wind shadow. The higher you are the greater the wind flow in relation to ground level; this means placing the wind turbine on top of a hill or on top of a mast for maximum benefit. The other factor is wind shadow; when an object is placed in front of the wind turbine it causes turbulence that decreases the efficiency of the turbine.

HIBS

Our recent project at HIBS involved C-Bus control of lighting and heating, as well as installation of new electronic light fittings throughout the school.

Lincoln High

Lincoln are now using C-Bus to control their underfloor heating (as well as lighting in selected areas), and have installed efficient new light fittings.

Napier Boys High

The graph below shows the savings Napier Boys have achieved since installing new light fittings and controlling their hostel boiler and hot water. That's impressive!

A recliner that goes 40 KPH

The Toyota battery-powered *i-unit* prototype is a brilliant show-case for automotive electronics – with a healthy dose of environmentalism thrown into the mix. Toyota says it designed the one-seater vehicle to evoke a leaf but one reviewer says it looks more like a “cross between a jet-pack and an undernourished Pokemon character on wheels”. It's made of plastic-like materials derived from corn, sugar cane and kenaf, a fast-growing plant native to Africa, with a scuffless silver paint job and 4,500 LEDs for safety and decoration. It has an orb-like controller that takes the place of the steering wheel, accelerator and brake pedal.

At slow speeds the driver is nearly vertical in the open cockpit and the front wheels sit just a few centimetres from the rear ones. But for faster speeds the driver can push a button which makes the rear and front wheels slide apart and seat recline, offering greater stability on the road. There's no seat belt but the arms embrace the driver in a hug and get tighter as the *i-unit* speeds up. The driver's head is enclosed by a transparent shield which reflects the multihued LED display.

Toyota's chief engineer Yoshiaki Kato says from a technical point of view they are very close to being able to mass produce the unit, which might actually be



Upright position in low speed mode

Reclined position in high speed.

Wind Power

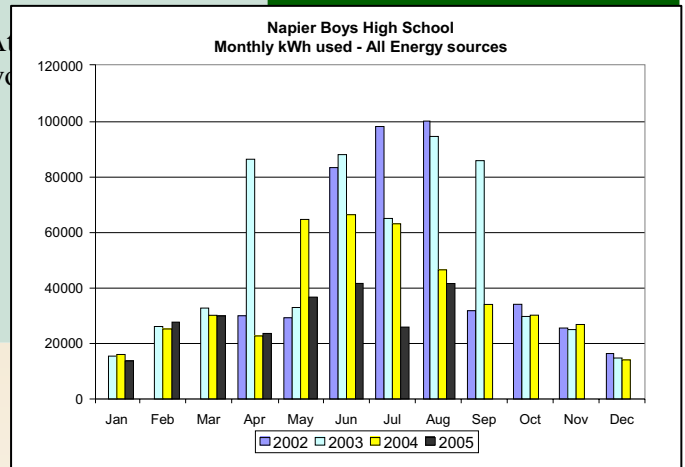
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Therefore decide which direction the prevailing wind blows based on historical meteorological data and check the planned placement of the wind turbine for natural or man made obstructions that may interrupt or disturb the wind flow.

The second consideration is gaining resource consent for putting up a tall (and to some people unsightly) structure that generates noise. Gaining resource consent should be taken as a first step as opposition can come from many quarters (as has been seen in the media). Therefore don't invest too much money in planning as you may not get past the first step.

The last but probably most important consideration is cost. Many different factors will affect the cost such as the generating capacity of the wind turbine, connection to the national grid, the voltage of the battery banks (typically either 12V or 24V), the generation control system and the size of the inverter required. The lower the KW output, the cheaper to install however economies of scale do come into play and by quadrupling the output (KW) the cost will typically be tripled. A drawback to increased KW output is that a higher minimum wind speed is required for generation.

A wealth of information on wind power is available on the Internet. The New Zealand and Danish Wind Industry Associations have particularly good sites at <http://www.windenergy.org.nz> and <http://www.windpower.org/>



ECO STAFF NEWS

What we have been up to:

JCI Update

In November, ECOsystems staff members Kevin and Scott travelled to Sydney for 3 days of further training on Johnson Controls. They are now fully qualified and trained on the new range of Johnson products that are being released here shortly. ECOsystems has already started assisting in the upgrades of existing JCI sites in New Zealand.

McDonald's Co-op

Also in November, ECOsystems were invited to attend the McDonald's Co-op in Auckland. Scott, John and Cameron went along and our stand received a lot of attention from the various McDonald's franchisees at the Co-op.

Of most interest was our graph of all the McDonald's sites half hourly energy data. We held a competition to see who could guess which energy pattern most resembled their own restaurant.

Congratulations to Bruce Davis of Colombo Street who won this competition. Bruce won a Centimeter to help him monitor his energy usage.



The ECOsystems stand attracted a lot of attention at the McDonald's Co-op.

McDonald's Project Updates

McDonald's Lower Hutt

Our local restaurant has long been a favourite lunchtime visit for members of the ECOsystems team. Now some of us are spending more time than usual there, managing the installation of an ECO EAS system.

Lighting is being upgraded to high efficiency dichroic lamps and LED fittings, controlled using C-Bus and light and motion sensors via the EAS. A touch screen provides pre-programmed scenes such as "pre-open", "restaurant open" and "restaurant closed" etc. Over-ride scenes allow transition or closing times to be extended if required. The EAS also controls the three air-conditioning units utilising restaurant time schedules. Finally a separate audible and visual alarm is being fitted to alert crew members when the freezer/cool room doors are left open for more than 15 minutes - a common cause of wasted energy.

The EAS will provide energy savings for the restaurant, as well as simplification for the crew. This project will result in substantial energy savings for McDonald's Lower Hutt – as an added bonus, our staff will be there on a regular basis to keep an eye on things, while we order our lunch !

McDonald's Merivale

Another restaurant to enjoy the benefits of the energy saving EAS system. After a very successful installation at Riccarton, the system is being installed at Merivale to control lighting, air conditioning and appliances. PIR control of selected lighting circuits is reducing running hours and maintenance costs for some (not commonly accessed) areas. Being able to isolate and control non-essential loads during periods of high costs will ensure that electricity costs are kept to a minimum. As network or line charges are charged differently throughout the country, control of each restaurant is optimised relative to these costs for maximum dollar savings.

Still to come ...

Auckland Airport (Drive Thru) and Frankton

We have completed energy audits and have the go-ahead for two projects at McDonald's Auckland Airport (Drive Thru) and McDonald's Frankton. Both sites will be using the Walker/C-Bus EAS to control lighting, appliances and air conditioning, as well as upgrading lighting to energy efficient lamps. Installation at these sites will be completed during January.

To date ECOsystems have completed projects in more than 20 McDonald's throughout the country. This ranges from full control with an EAS controlling all lighting, appliances, air conditioning and freezers etc, through to installation of the unique energy saving air handling units developed in conjunction with Climatech and Energy Products International.



McDonald's Merivale

The ECO GFX

GFXtechnology.com

- Saves 50-60% of shower costs
- No moving parts - double walled safety
- Self cleaning
- Use on gas or electricity boilers or cylinders
- Contributes positively to the environment by recovering waste heat and reducing the temperature of waste entering the ecosystem
- Get more hot water from a smaller cylinder or boiler
- Simple Installation



The ECO GFX is installed in a shower waste (or similar) and transfers the waste heat into the incoming cold water to halve the cost of showers.

The Quantum Hot Water System

The most efficient way of heating hot water. Technically, the Quantum is a heat pump. The Quantum is ideal for residential homes, hotels / motels, boarding homes and schools, multi-tenanted properties, rest homes, hair salons and many industrial applications.

- The most energy efficient hot water heater.
- Save up to 75 % of the energy used to make hot water.
- A standard 340 litre unit will make up to 1600 litres of hot water a day and 100 litres per hour.
- A heat pump based system that works in any weather.
- Heats up to 60 degrees C. in all weather.

More ECO Lights

454-4E Suspended / Surface Mount Light Fitting

The suspended or surface mounted 45E-4E offers excellent light output and a wide distribution for large spaces. The use of 54W T5 fluorescent lamps produces a sleek, efficient luminaire with a long lamp life. Suitable for gyms and warehouses with high ceilings.



4E and 5E Range – Energy Savings in Education

This energy efficient range offers a sleek high tech appearance and excellent light output. The fitting is suited for both suspension and surface mount in offices, classrooms and corridors. Save approximately 50% in annual running costs compared with traditional fittings.

ECO Light Fittings

ECO 2F2E 300 & 600 Range

The surface mounted, recessed or semi recessed, 2F2E fitting offers a high tech appearance and excellent light output. This energy efficient under veranda fitting uses fluorescent PL-L lamp technology.



ECO Power LED

The ECO Power LED has been developed to provide an energy efficient alternative to the dichroic halogens often used to provide sparkle effect or light up displays and artwork. The fitting comes complete with special optics.

The ECO Power LED is **energy efficient** - uses only 3W compared to a traditional halogen using 50W. It has an increased lamp life of up to 100,000 hours compared to 3,000 hours for a traditional halogen. It's simple to install, not sensitive to vibration and has low heat emission.



INTRACO

The ECO lite mentioned on the first page (installed at BP) is one of the products from our new INTRACO range of lighting energy controllers. These advanced economical units can save 25-35% of lighting energy consumption, extend the lighting elements lifetime, improve power factor and reduce line transmission losses.

