

# The Compass

New directions in Queensland industry



## Queensland carpet manufacturer blankets the competition

Most businesses recognise that to get ahead of the competition you need some kind of advantage to give you the edge.

For Gold Coast carpet manufacturer Northstate Carpet Mills, that edge comes in the form of an environmental commitment that has resulted in

massive waste disposal savings, bred a culture of cost-cutting and secured a three-year contract to supply carpet to Queensland Government buildings through its building supplier, QBuild.

These achievements put Northstate Carpet Mills at Destination 5 on the Sustainability Roadmap\* - a position

that allows it to attract socially responsible investment and gain market advantages.

\*Visit [www.epa.qld.gov.au/environmental\\_management/sustainability/industry/sustainability\\_roadmap/](http://www.epa.qld.gov.au/environmental_management/sustainability/industry/sustainability_roadmap/) for further information

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## Innovative Waste Technologies - turning big problems into big profits

Industry take note: the greater the volume and strength of your wastewater, the larger your economic benefits will be.

That is the promise from Innovative Waste Technologies (IWT) Chairman Lionel Freedman who, after six years of

patience, persistence and perseverance, has developed a pilot wastewater treatment process that will deliver six-figure returns for his first client, A. J. Bush and Sons, Australia's largest animal by-products rendering plant, in Beaudesert, Queensland.

IWT's innovation offers a commercially viable alternative to wastewater treatment that generates profits while arming its clients with socially responsible and environmentally friendly credentials as well.

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## Queensland Health initiative cuts costs and greenhouse gas

As part of the Government Energy Management Strategy announced in 2003, Queensland Government departments were given a charter to cut greenhouse gas emissions and their use of energy, water and other resources.

When organisations commit to new ways of doing things, a change in the culture is also often required.

Cultural change in an organisation can only occur if it has people with

the will and ability to deliver it, and Queensland Health has two such people. Eco Efficiency Unit Manager Pat Maguire and Principal Adviser Linda Gava have combined energy- and water-efficient technology, local expertise, modern thinking, regional partnerships and lots of hard work to bring about a cultural change that has made waves all the way to Ireland.



As part of its eco-efficiency in hospitals project, Queensland Health will install 1500 square metres of solar panels

*Continued pages 6 & 7*

# Building Australia's solar future

In the May 2005 Federal Budget, additional funding was granted to extend the current Photovoltaic Rebate Program (PVRP), originally set to cease on 30 June this year, to 30 June 2007.

The PVRP is a federally funded, State-administered rebate program that provides assistance with the cost of installing grid-connected photovoltaic (solar) panels in residential and community buildings.



## Dear Reader

One of the best things about my job is editing *The Compass*. Stories about the ground-breaking work being done by many Queensland businesses and government agencies remind us that notwithstanding the urgency of the sustainability imperative, progress is being made and change is happening for the good.

In this issue, we cover many topics, from new polyoptic lighting for refrigeration to mud farming at an alumina refinery, and saving hospital dollars through eco-efficiency. All our stories point to the importance of better understanding how systems work when designing infrastructure, processes and products.

So much energy is wasted, for example, by contradictory functions being co-located or integrated invisibly: heat-generating lights in refrigerators; or heaters to warm consumers under open supermarket chiller troughs. Such contradictory combinations explain why so many greenhouse gas emissions can be attributed to the retail sector.

Far more efficient alternatives exist, such as polyoptic lighting or even something as basic as chiller covers. At a time when home air conditioning is putting enormous summer demands on our electricity system and boosting home energy bills, our story on Sydney-based Air Change points to the savings to be made by using energy transfer units.

If attendance at a business sustainability course is anything to go by, corporate Australia is beginning to understand the importance of organisational change for corporate

So far, in its five years of operation, the PVRP has resulted in more than 1050 systems being installed in Queensland, which equates to greenhouse-gas-emission savings of more than 40,000 tonnes over the 20-year life of the systems. This is the equivalent of taking more than 600 small cars off the road for 20 years.

For further information on the PVRP, contact the Queensland Government's

Energy Advisory Service on 1300 369 388 or visit [www.epa.qld.gov/sustainable\\_energy](http://www.epa.qld.gov/sustainable_energy)



sustainability. Delegates from eastern Australia attended a week-long executive intensive course hosted by the University of Queensland Business School and the EPA.

The core messages delivered were: sustainable development remains the biggest unexploited business opportunity of our times; the principal impediments to the adoption of sustainable practices are cultural; and leadership in seizing the opportunities needs a different style of thinking to the "business as usual" mode. Get into the "thinking sustainability" zone and the opportunities become real.

The business benefits of corporate sustainability are well known and documented, and include:

- regulatory compliance
- resource productivity
- cost savings and competitiveness
- risk reduction
- consumer loyalty and trust
- reputation and improved public profile
- new markets and business growth
- shareholder and investor satisfaction
- comparative advantage
- doing the right thing.

In the EPA we know that to be credible in promoting sustainability thinking we have to "walk the talk", and as *The Compass* outlines in this issue, we are doing just that with our Office Sustainability Tool Kit.

Yes, it pays to be green - just talk to one of our WasteWise partners, Northstate Carpet Mills, which has just won a major government contract, partly on the basis of its environmental credentials.

To become sustainable, organisations need champions for change or "change agents". You can meet a couple in

our interview with Pat Maguire and Linda Gava from Queensland Health. Their efforts with energy performance contracting will deliver significant dividends to at least three major Queensland hospitals.

Effective change agents need good systems and strategy. A decade ago, James Speth, one of the founders of the World Resources Institute in Washington DC and now Dean of Forestry and Environmental Studies at Yale University, wrote that sustainable practices could not happen without changed individual values and behaviour. He indicated also that the transition to sustainable development required understanding and conceptualisation, transparency and participation by the community and consumers, goal setting and strategy, and, not least, measurement and indicators of change or progress.

To make the most of change, Speth pointed to the innovation experience needing constant evaluation to keep it topical and where necessary, to be complemented by policy adjustment on the part of governments or corporations.

I can see the adoption of his message is very much to the fore of all the stories that come with this *Compass*. I hope you enjoy the read and find the stories useful.

John R Cole Ph D  
Executive Director  
Sustainable Industries Division

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Northstate Carpet Mills Inventory Controller Mike Davis said the road to achieving competitive advantage started with a phone call to the Environmental Protection Agency (EPA) in 2002.

“I’m not a greenie or anything like that,” Mr Davis said. “Basically this whole journey started from wanting to reduce inventory.

“We were wasting too much and I said: ‘we’ve got to bring that down’ so I rang the EPA and the next thing I knew we were joining the WasteWise program and from there it just kept going and going.”

Through WasteWise, Northstate Carpet Mills realised some instant financial and resource savings - in the first year, the company saved more than \$320,000 in excess raw materials inventory and waste disposal costs. For example, its yarn was delivered in re-usable plastic wrap instead of cardboard and its excess yarns were made into saleable carpet products.

With its savings, Northstate Carpet Mills purchased a compactor to reduce the volume of its waste and therefore its disposal cost. The payback period on this investment is expected to be about a year. The company is also waiting to take delivery of equipment that takes unused yarn off small tubes and puts it onto bigger ones so it can be re-used.

These simple steps are helping compound the company’s savings at the same time as giving it impressive environmental credentials.

### A surprising market advantage

What happened next for Northstate Carpet Mills was even more significant than their enormous savings - it beat its larger competitors to the coveted contract supplying QBuild’s carpets for the next three years.

Northstate Carpet Mills General Manager Neil Verran said the company’s desire to be sustainable and its environmental record were what helped secure the contract.

“I have no doubt that what got us over the line was all the environmental stuff we’ve been doing,” Mr Verran said.

“We’ve done quite a few things like joining WasteWise and setting up partnerships with our suppliers, and I’m positive this had an impact.

“Northstate is aiming to be an environmentally friendly company by being part of WasteWise and **ecoBiz**. We didn’t start out to use these things as an advantage, but it *is* an advantage.

“The minute you start coming in with something a bit different like a commitment to the environment, you get an advantage.”

Mr Davis said securing the QBuild contract had helped raise the Northstate Carpet Mills profile in the community, created employment opportunities and boosted employees’ security and morale.

“Dollar-wise I’m not sure what it’s worth but business-wise we’re preparing to run 24 hours a day at some of our key work centres and obviously will employ additional personnel to run them,” he said.



The Northstate Carpet Mills compactor paid for itself in less than a year

### Wall to wall eco-efficiency the next goal

Mr Davis said Northstate Carpet Mills was already thinking beyond the term of its first QBuild contract, to how it could improve environmentally three years down the track.

“**ecoBiz** is our next thing,” Mr Davis said.

“The contract proposals have to be redone every three years, so by joining **ecoBiz** and working on our water and energy efficiency, we’ve got another opportunity to put ourselves further ahead of the competition.

“When we talked about improving our environmental performance as a business strategy, we knew there would be things we’d have to change about ourselves to achieve it.”

Mr Davis said the changes had now filtered throughout the rest of the company.

“If I didn’t ring the EPA we would probably have continued to manage our materials waste in much the same way and we wouldn’t even be thinking about our water and energy consumption,” he said.

“There’s a much greater awareness now and positive input from our people on the factory floor that we’re serious about reducing our waste and our resource use.”

For more information about the **ecoBiz** Queensland program, visit [www.epa.qld.gov.au](http://www.epa.qld.gov.au), email [ecoBiz@epa.qld.gov.au](mailto:ecoBiz@epa.qld.gov.au) or contact (07) 3225 1999.



Mike Davis (left) and Neil Verran believe the company’s environmental initiatives helped secure Northstate Carpet Mills a three-year contract to supply the Queensland Government’s carpets

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Organisations that discharge high organic-load wastewater face increasing government and financial pressures to reduce their environmental impacts.

According to Mr Freedman, IWT has the perfect solution - one that reduces production and compliance costs, improves environmental performance and requires relatively low capital and operating costs.

IWT brings together high-powered ultrasonics, energy generation from biogas, and electrocoagulation - three stand-alone technologies each with their own commercially proven benefits that when bundled, Mr Freedman said, multiplied these benefits exponentially.

"This idea takes one of the oldest forms of electricity generation and adds technology to make it a viable tool for biogas production," he said.

"Methane production from waste has been around for years, but we're using technology to improve on it.

"We've demonstrated that if you take high-organic waste loads and put them through ultrasonic treatment, it breaks them down more and leaves a larger surface area for the anaerobic bacteria to work on. We get better digestion then, meaning more biogas."

#### **Profitable solution to an old problem**

Biogas collection from covered anaerobic wastewater ponds is not a new idea. However, problems occur with some ponds because of crust formation and build-up of dense grease and fat. The IWT system effectively doubles biogas production while reducing crust and sludge formation. The only remaining 'solid' waste from IWT's process is pure-protein foam that can be used to boost the protein in meat meal or as an organic fertiliser.

In addition, the quality of the discharged water is significantly enhanced and therefore available for re-use. However, it's when Mr Freedman starts talking about the financial benefits from his innovation that he begins to get really excited - and it's easy to see why.

"It's difficult to put an exact dollar figure on the process because alternative power generation is in a very dynamic state at the moment," Mr Freedman said.

"What we can say is that the biogas it generates has a value in accordance with the actual cost of natural gas - about \$250,000.

"But its value as electricity would be upwards of \$350,000 a year. If you generate electricity instead of gas, you also get 4600 renewable energy certificates (RECs) worth \$39 or \$40 each.

"That's another \$180,000 a year, so all of a sudden you've gone from \$250,000 to more than double that if you produce green electricity.

"I believe we're on the cusp of an incredibly exciting industry here, because this income is literally going into the air as greenhouse gas."

Mr Freedman said that kind of return represented a very attractive payback for any business, and the bigger the wastewater disposal problem, the better the potential benefits from the solution.

"The benefits to A. J. Bush and Sons are that they'll be recognised as responsible corporate citizens," Mr Freedman said.

"A. J. Bush and Sons have shown real leadership in this area by putting their money on the table to match the government grants dollar for dollar to show the food processing industry what is achievable through environmentally responsible action.

"They'll have a significant impact on their greenhouse gas production

and they'll improve their working conditions and the environment of the surrounding community by taking odours out of the equation.

"They could be replacing anything between 25 to 50 percent of the site's energy needs and reaping some significant economic benefits."

#### **EPA and industry assistance sparks pilot plant**

Establishing the pilot plant was made possible through an EPA EnergyWise grant of \$100,000, and a similar contribution from A. J. Bush and Sons. With the promise of a further dollar-for-dollar contribution from A. J. Bush and Sons, IWT secured an additional \$715,000 grant under the federally funded National Food Industry Strategy to commission an advanced pilot plant, worth \$1.43 million.

Mr Freedman said the pilot plant might never have got off the ground without the initial funding.

"We're grateful to the EPA and A. J. Bush and Sons for enabling us to conduct the trial. That helped us lay the groundwork to get the federal grant so the full-scale trial could proceed," he said.

Mr Freedman has started fielding inquiries from industries in Japan and south-east Asia, where the potential environmental, economic and social benefits could be huge.



Tower Consulting

The only "solid" generated by IWT's process is a protein-rich foam

# The Natural Advantage of Nations

The *Natural Advantage of Nations* pulls together, for the first time, the work of more than 30 of the world's leaders in sustainability. It contains fresh evidence from around the globe to show that the drive for a sustainable world is both a practical and profitable necessity and an environmental imperative that is already happening.

This book draws a bold vision for the future and tells us how to get there by building on the lessons of competitive advantage theory and the latest in sustainability, economics, innovation, business and governance theory and practice.

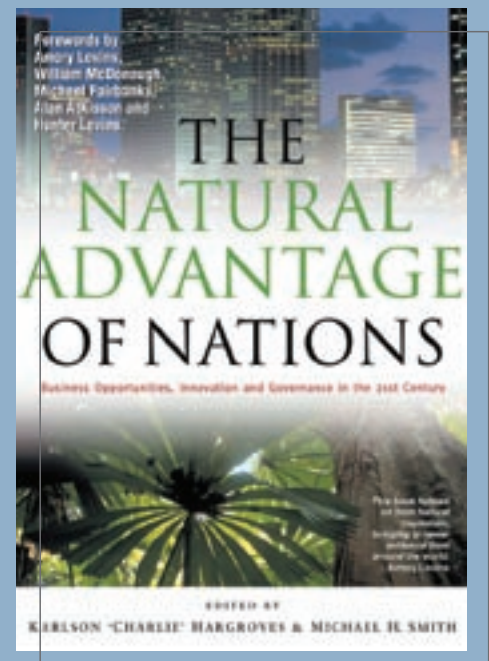
The authors explore the role that governance can play in both leading and underpinning business and communities in the shift towards a sustainable future. The resulting vision is one in which business, government and communities all have a say in forging a sustainable future.

Dr John Cole, Executive Director of the EPA's Sustainable Industries Division, said the book would be a useful tool for government and industry in showing how to make the right steps toward a sustainable economy.

"The *Natural Advantage of Nations* will provide a graphic and compelling view of the kind of future we all might have if we truly commit to achieving sustainable development," Dr Cole said.

This book is about innovation, solutions, competitiveness and profitability and is top-drawer reading for business people, economists, engineers, consultants, policy-makers, researchers, students and indeed anyone working to create a better world.

For further information on the book or for details on where and how to purchase a copy, visit [www.thenaturaladvantage.info](http://www.thenaturaladvantage.info)



## A change in the air for air conditioning

Hospitals, supermarkets, fitness centres and schools could all benefit from using technology that provides fresher air than standard air conditioners at less expense.

The technology, developed over several years by Air Change Managing Director John Urch, achieves both energy efficiency and indoor air quality - the two biggest issues for air conditioner manufacturers - by bringing fresh air in through a heat exchanger that helps it absorb the temperature of the air it replaces.

What this means, according to Mr Urch, is pre-cooled and de-humidified air in summer and pre-heated air in winter at around half the cost.

"The heat exchanger works on a vapour pressure difference but there is

a basic premise that hot goes to cold and wet goes to dry," Mr Urch said.

"When the conventional systems attempt to deliver the same amount of fresh air (as the Air Change system), they need to increase in size and cost and require twice the energy to deliver the same fresh air."

The Air Change units enable building designers to incorporate energy efficiency and outdoor air all in the one air conditioning system.

Mr Urch said the unit was packaged so contractors no longer needed to find and combine various components and try to make them work together at each new site.

"Once it gets to the site... the unit is ready to go - you just connect your

ductwork and electricals, commission the unit and away you go," he said.

With the cost of providing energy to power air conditioners increasing, the push is on for organisations to get a better return from each dollar spent on thermal comfort.

Air Change units provide an energy-efficient alternative to standard air conditioning, and early results from trials at Queensland schools suggest the energy savings are significant.

For further information, visit the Air Change website: [www.airchange.com.au](http://www.airchange.com.au)

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Through Queensland Health's eco-efficiency initiative, Mr Maguire and Miss Gava are helping the Government achieve its goal of fewer greenhouse gas emissions by upgrading inefficient facilities and equipment, creating jobs in the state's regions, and providing financial and energy savings.

"Our main focus is the reduction of energy and water use, including the reduction of carbon dioxide," Mr Maguire said. "The by-product of achieving these objectives will be reflected in financial savings."

"That's right," Miss Gava said. "They're saving money, they're getting new or enhanced assets, their utility bills are dropping and they're retaining the savings to spend as they like."

"Energy performance contracting is the key."

**Better facilities today by saving energy tomorrow**

Miss Gava said energy performance contracting (EPC) was the essential ingredient in the project's mix. EPC allows an organisation to make improvements to a facility that will reduce its resource use and save money.

EPC is offered by energy service companies, or ESCOs, which make recommendations based on their detailed study of a facility. The ESCO

lists a series of cost-effective energy conservation measures and the organisation selects which of these they want.

"That's the bonus with EPC - you can actually achieve specific energy conservation measures out of it," Miss Gava said.

"You might not want to go with the whole proposal - you might just want to go with some lighting and some water savings."

The ESCO then implements the chosen recommendations and guarantees that the resultant savings will cover the project costs, or reimburses the organisation should the savings fall short.

Using this approach, Queensland Health has avoided taking on any financial risk while guaranteeing greenhouse savings and enhanced facilities at Nambour, Ipswich and Cairns hospitals - the three pilot sites.

**EPC the tonic for a healthier bottom line**

Mr Maguire and Miss Gava have negotiated for the individual facilities to keep the savings they make to spend on whatever they need: more beds, better equipment or even more energy-saving equipment.

"They can pretty much invest the savings into whatever they like," Miss

Gava said. "They can inject it into more energy efficiency or clinical issues for example."

From the outset, Mr Maguire and Miss Gava have worked towards running a project that is more innovative than most - and have succeeded.

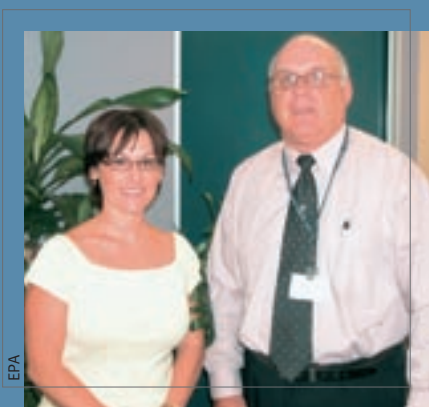
"Our Nambour and Ipswich sites have 1500 square metres of solar panels being installed to generate hot water," Mr Maguire said. "They're concaved, self-cleaning and as big as half a footy field."

Kevin Bidgood, Project Co-Ordinator at Cairns Base Hospital, said most of the greenhouse gas savings there would come from replacing inefficient equipment.

"There'll be modifications to installed lighting systems and putting in variable speed drive controllers for the main air-conditioning plant and ward air handling units," Mr Bidgood said.

"We'll also be installing dehumidifiers for the operating theatres because at the moment we overcool the air to remove the humidity and then have our undersized heaters running continually to raise the temperature.

"By doing all this, we'll reduce our carbon dioxide emissions by 1251 tonnes, get electricity savings of \$85,560 and gas savings of close to \$16,000. Water savings will be \$48,000



**Pat & Linda profile**

at all the savings that can be made. Let's do something about it." Then we started doing some research and found out a little bit more about energy performance contracting and said: "Let's run with it!"

**Q:** So how did you make the hospitals' eco-efficiency projects work?

**Pat:** We stumbled. It's a learning process. We're not going to pretend we're gurus at it - we're learning every day. But we didn't want to make the same mistake as other agencies by trying to do it part time and not pay due diligence to it. So we sat down, put a proposal together and had it signed off.

**Q:** Did you get the support you needed?

**Linda:** I think people thought we were a bit mad at first. It was almost like it was too good to be true, so therefore it couldn't be right.

**Pat:** They didn't think it would work but we had all the figures and we did our research. There was a lot of background information we needed to put together before we could progress.

**Q:** What was the driving force behind this project for you?

**Linda:** We saw it as an "in" for the future sustainability of Queensland Health. We believed in it 110 percent. It was just Pat and I going around

**Q:** How did the Eco-Efficiency Unit come about and how did you become part of it?

**Linda:** We were actually working together on this project from separate units and eventually we said: "look

in the first instance, and the reduction of maintenance costs with the new equipment will be \$24,199.

“All up, these measures will save us in the order of \$180,000 a year.”

In total, the initiatives are expected to save the three hospitals about 5.6 million kilowatt hours, equivalent to taking almost 2000 cars off the road each year, and reduce energy bills by up to \$250,000 each. For an organisation like Queensland Health, that's money that can be much better spent.

#### **Local benefits with international appeal**

Mr Maguire said if a health service district decided to re-invest the savings into more energy conservation measures, chances were the local community would benefit, as one of the project's goals is to create local jobs and improve local skills.

“One of the priorities of the Government is working with local industry and we make sure we abide by that,” Mr Maguire said. “We're very much of in favour of ‘buy local’.”

“The best part of energy performance contracting is that the ESCOs train the contractors in how to maintain the new equipment,” Miss Gava said. “So to a certain extent, they're being reskilled.”

She said local communities were not the only beneficiaries of the hospitals'

energy efficiency initiatives - other Queensland Government agencies were also picking up on the ideas. The Department of Corrective Services, the Corporate Administration Agency and TAFE Queensland have all expressed interest in learning more about the project.

“We're the most advanced in the Queensland Government with regards to energy performance contracting, so I guess if they can learn something from us, it's a big bonus,” Miss Gava said.

The work Miss Gava and Mr Maguire are doing for Queensland Health received the highest praise last year when Premier Peter Beattie, while on a trade mission to Ireland, suggested the concept could be sold overseas.

“If the test programs produce the forecast savings, the Queensland Government and the companies involved will market and sell the intellectual property,” Mr Beattie said.

Bill Stewart, Acting Senior Executive Director of the Resource Management Directorate at Queensland Health, said it was pleasing to see the department could contribute to the Government's agenda to the extent of export potential.

“This is really an excellent example of applying the Smart State concept, and it shows what Queensland can do,” Mr Stewart said.

#### **Project a shot in the arm for industry**

Mr Maguire said the project captured many of the Government's key priorities - improving health care, improving workforce skills, supporting the state's regions through job creation and protecting the environment for a sustainable future - all in one hit.

“One of the ESCOs told us that because of what we're doing, they're in a position to engage full time two new engineers,” Mr Maguire said.

“That's good for them and when they're not a big company to start with, this percentage of increase in staff is significant.

“That's one of the things we're finding with this project - we're taking industry along with us and they're growing as a result.”

The project was kick-started back in 2002 with funding from the EPA, without which Mr Maguire said the project might never have seen the light of day.

“Initially the EPA created the impetus by advancing some funds to have the three pilot sites audited,” Mr Maguire said.

“We drove the outcome of the audits after that, but we probably wouldn't have picked it up at all without the EPA.”

“preaching the word” until people really did take up on it. Now everyone wants to be involved because they can finally see the benefits in every way, shape and form.

**Pat:** The common question put to us after each presentation is: “What's the catch?”

**Linda:** That's right. They're saving money and they're getting new assets. Retaining money to do whatever you like with sounds too good to be true as well. But a little bit of hard work initially and energy performance contracting were the keys.

**Pat:** We eliminated all risk for the districts and for Queensland Health and placed it on the ESCOs to perform.

**Q:** With the project being so popular, do you need any extra people now to help you out?

**Linda:** No, the districts are managing it on site. We just provide the guidance and expertise and keep a close eye on their progress to show the success of the project.

**Q:** Is there a single achievement you're particularly proud of?

**Pat:** We're happy it has got up and going and we've got the support needed to get it going. I think they've supported it because people have accepted that we've demonstrated it's realistic and it'll work. I think that pays tribute to our project and ourselves as part of that project.

**Q:** Have you noticed a culture change in Queensland Health now there's a bit more awareness of what you do?

**Linda:** Yes, definitely. We had all those people against it to begin with and wondering whether it could work and now they're all with us.

**Q:** So what's next for the two of you, once everyone's self-sufficient and the EEU isn't needed anymore?

**Pat:** That'll be some time away, years down the track. In the meantime what's next for us is to just keep pursuing any excellence in the area of energy efficiency and to assist any health service district we can to achieve it.

# Sustainable housing - is it catching on?

Change is coming rapidly to the Australian home whether we like it or not - shortage of land, town planning and building restrictions, demographic changes and diminishing supplies of water and energy promise to change our future urban landscape.

According to recently retired Queensland State Chairman of First National Real Estate, Colin Webber, home buyers are increasingly considering environmental efficiency initiatives as standard items when inspecting properties.

"Our agents are reporting strong buyer preference for homes that have incorporated environmentally friendly features into their design or renovation," Mr Webber said.

"Features that are gaining buyer interest and contributing to property values are water and energy efficiency features such as solar energy and water-conservation products."

Renowned Sunshine Coast architect Gabriel Poole said it was a good thing home buyers were leading the charge because builders and developers were lagging behind.

"In my ongoing discussions with the building industry I have rarely heard mention of the levels of energy expended in the overly large houses which now form the basis of our domestic built environment," Mr Poole said.

"These houses squander materials and energy and in so doing, help to degrade our environment."

But the strain on the environment isn't the only thing that should be sparking the industry into action. Statistics from the Australian Productivity Commission



Supplied by the Department of Housing

Having louvre windows helps generate cross breezes and offers an inexpensive way to cool a home

show that by 2045, one-quarter of Australians will be over 65 - roughly double the present figure. This emphasises the need for housing to accommodate the changing needs of ageing Australians by incorporating the social aspects of universal design.

A century ago there was an average of 5.3 people in each Australian household. Now we have half that - and the number is falling fast - yet the industry continues to build large houses.

Mr Poole said the 'McMansion' phenomenon faced certain extinction as statistics provided a wake-up call for people thinking about building large homes.

"Large buildings currently are little more than ego trips," he said. "In the future, large houses will be neither affordable nor desirable. But if we

are going to go big, let us at least go smart as well."

## Economic benefits of building smarter

Director of Sustainable Development Strategies, Dave Luxmoore, has completed a study of three display homes built last year at Springfield, 28 kilometres south-west of Brisbane. His report details the cost of building homes with sustainability features, many of which use off-the-shelf ideas that can be taken up easily and mainstreamed as project homes.

In a new home costing \$260,000 to build, Mr Luxmoore states that for 2.3 percent of the total cost, passive design elements such as orientation, insulation, window treatments, higher ceilings and shading can be included.

For one percent of the total cost, energy-efficient elements such as greenhouse-efficient hot water systems, lighting, fans, appliances and smart meters can be included.

The average cost to incorporate liveability elements such as wider doors and hallways, level entry thresholds, slip-resistant floors and good casual surveillance, was 0.2 percent of the house's total cost.

At no additional cost, home owners can have better air quality through use of non-toxic paint, low-toxicity floor and timber finishes, as well as AAA-rated shower roses, dual flush toilets and internal tap restrictors.

Mr Luxmoore concluded that these features would generate savings to pay for themselves in just 12 years - even sooner if the savings were re-invested into the loan.

With the average house standing for over 60 years, Mr Webber said it was little wonder home buyers were demanding sustainability features as standard.

"Buyers are realising environmentally friendly features mean lower maintenance costs and expenses over the long term, so they are prepared to pay for them," he said.

"They are looking for these features in the same way they have always looked at traditional interior design finishes such as flooring and curtains.

"People who are renovating to sell should keep environmentally friendly features in mind, as they are a growing trend."



Supplied by the Department of Housing

Northward orientation and rainwater harvesting are two sought-after sustainability features



# Sustainability strategies at Comalco on a roll

Comalco Alumina Refinery (CAR) near Gladstone is increasing profits through sustainability strategies that are more than just technological add ons - they have become part of the company's culture.

With 400 full-time employees, CAR has the capacity to refine more than 1.4 million tonnes of alumina each year. Aluminium's endless recyclability means that it can go on forever, and CAR has a commitment that this be the only legacy of its Gladstone operation.

CAR Environmental Specialist David Smirk said just because the company's product could go on forever, didn't mean the company's footprint had to as well.

"Our philosophy is pretty straightforward: 'Do it once, do it right and don't create a legacy,'" he said.

Bauxite residue is the major by-product of the alumina-refining process, and CAR produces more than a million tonnes of it each year. The residue consists of undissolved components on the bauxite ore, residual traces of caustic soda, water and traces of additives used in the refinery.

To minimise environmental impacts from this residue, CAR adds seawater to neutralise the caustic soda. The resultant slurry is then pumped inland to a 600-hectare residue management area made from natural clay to prevent seepage.

The slurry is thickened to a consistency similar to toothpaste and deposited into a residue management area where it is dewatered using a state-of-the-art dewatering bulldozer called an Amphirool to compress the slurry while the sun dries it out.

The Amphirool compression makes the residue non-permeable and because the surface is always slightly wet, this process, called "mud farming", reduces the chance of dust problems.

Although the process seems simple, Mr Smirk said the resulting benefits were significant.

"With the use of the Amphirool, we're able to store residue at a higher

density and strength," he said. "We use only half the area compared to a conventional residue disposal system.

"In addition, we can manage residue at a lower overall cost due to the reduction in footprint and supporting structures required."

Mr Smirk said CAR had committed to remediating the area when the plant eventually closed.

"In our Environmental Impact Statement (EIS) we committed to producing a landform classified as non-productive agricultural land, which is effectively a grassy hill," he said.

"When it comes to remediating the land, we will take community consultations at that time. Our community may wish to examine options such as a wind farm or a golf course, but at this stage, anything's possible.

"We have an educated community in Gladstone when it comes to the environment, so to make ours a better project we'll need to ask what they want."

This regard for environmental issues and community expectations forms part an ethos at CAR, which focuses on preventing causes rather than managing symptoms.

"It is not only an environmental issue, but an economic one as well," Mr Smirk said.

"We do things this way because we don't have the resources to react to problems. It is inefficient and doesn't align with our EIS commitments.

"Our philosophy is to prevent problems in the first place. In this way you stay true to your community commitments and true to your economic reality."

CAR's philosophy goes beyond just doing well financially by doing the right thing environmentally and socially. It recognises that profitability requires an understanding of what makes profits more likely.

Mr Smirk said CAR's philosophy was about changing the culture of the company and the way people thought about the environment.



Waste from the alumina refinery is pumped to a residue management area before being rolled, compacted and dried

"The greatest opportunity to change the world lies between people's ears," he said.

"So we've developed an environmentally aware workplace where our staff are taught to separate their waste at source so we get resources, not problems.

"Under each desk is a split bin for general waste and recycling and every employee is responsible for sorting their waste themselves.

"This initiative alone saves us thousands of dollars a year and it cost us nothing to set up, nothing like that to maintain, it's a great environmental outcome and it's created a great culture."

Mr Smirk said while there were clearly environmental benefits from some of CAR's initiatives, the direct benefit for the publicly listed company was that it reduced costs.

"Shareholders want good financial returns, but if they invest with us they'll get environmental ones as well," he said.

"We don't fight the environmental cause from high moral ground - we argue it from a business case where good business equals good environmental behaviour."

Companies such as CAR understand that business growth and profits cannot exist independently of the environment and communities in which they operate.

CAR is demonstrating that sustainability is about addressing the legacies of the past, managing the realities of the present and planning for a better future.

## Benefits of eco-efficiency continue to trickle through

Buderim Ginger, Australia's largest ginger processor based at Yandina on the Sunshine Coast, has used an **ecoBiz** Queensland grant to turn a potential problem into a money-saving opportunity - and the benefits are compounding.

Buderim Ginger has operated at its current location in Maroochy Shire since 1981. With more than 150 staff on site, and 30 growers and their employees largely dependent on Buderim Ginger's custom, the company is one of the largest employers in the shire and contributes more than \$40 million a year to the local economy.

Changes to both the wastewater infrastructure and the price of discharging wastewater in Maroochy Shire have forced Buderim Ginger to look at new ways of reducing their wastewater discharge.

The main problem for Buderim Ginger has been that its wastewater contains high levels of sulphite, a processing aid to preserve ginger. This sulphite is treated on site prior to discharge, but can cause problems with the council's sewer system as it can form hydrogen sulphide, or rotten egg gas, further down the line.

After five years of trials and investigating more than 16 different technologies, Buderim Ginger settled on a Sessil trickle filter to clean up the water before discharging it.

The trickle filter will treat 400,000 litres of water a day and reduce biological oxygen demand (BOD) and suspended solids (SS) by up to 90 percent. The treated wastewater will then be pumped through a filter into a holding tank before being discharged. This process will also help the council in its efforts to clean up the local environment and waterways.

Adding a membrane batch reactor to the process would enable Buderim Ginger to recover and re-use some of its wastewater on site while also reducing its wastewater load on the local council's infrastructure.

Buderim Ginger's Process and Engineering Manager, Steve Dennis, said re-using wastewater made a lot more sense than wasting it.

"We have been doing a lot of investigating to see what we need to do to get the most out of our water when we use it," Mr Dennis said.

"For example, I know there's a local company keen to use it if we could guarantee them a supply."

Mr Dennis said the membrane batch reactor would be installed as stage two of their effluent project to give Buderim Ginger up to 144,000 litres of re-usable water each day and save thousands of dollars in water and disposal costs.

"For an initial investment of just over \$1.3 million for both stages, we are

predicting savings of more than \$300,000 a year," he said.

Mr Dennis said Buderim Ginger would use a rebate it received through the Environmental Protection Agency's **ecoBiz** program, to partly fund the project.

"Joining **ecoBiz** has really helped us pull all our ideas together because it flows on from some of the eco-efficiency projects we've been doing," he said.

Buderim Ginger is also considering recovering previously wasted heat, automatic ventilation control, a future compressor upgrade and solar pre-heating.

Mr Dennis said Buderim Ginger wanted to become a zero-discharge company and set itself up as a local eco-efficiency example.

"We've got the whole company thinking about what we do with our water before we dispose of it," Mr Dennis said.

"One thing the company did as part of the latest enterprise bargaining agreement was to include an incentive payment for all factory staff based on reductions in water use.

"And because we're a tourist attraction, we're going to try to set ourselves up as an eco-friendly company where we re-use everything.

"We're thinking about setting up an eco-tour around the factory because we'll be cleaning our water up before re-using it through the factory and the gardens."

Buderim Ginger has worked hard to find a solution that will ultimately save money, place less stress on local infrastructure, reduce wastewater discharge and secure a future for the region's farmers and their employees who rely on a prosperous Buderim Ginger for their livelihoods.

**ecoBiz** participants may be eligible for a rebate of up to \$150,000 to help them become more eco-efficient.

For more information about **ecoBiz**, visit [www.epa.qld.gov.au](http://www.epa.qld.gov.au), email [ecoBiz@epa.qld.gov.au](mailto:ecoBiz@epa.qld.gov.au) or contact (07) 3225 1999.



By re-using its wastewater, recovering previously wasted heat and addressing ventilation control, Buderim Ginger are significantly cutting waste, water and energy costs

# Gold Coast company sheds light on store refrigerators

Queensland Sustainable Energy Innovation Fund (QSEIF) recipient Poly Optics Australia Pty Ltd has developed a new lighting system for commercial refrigerators that is three times more energy efficient than standard lighting and lasts 12 times as long.

With the assistance of a \$150,000 QSEIF grant, Poly Optics developed a fibre optic light distribution system and coupled it with the latest light-emitting diode (LED) technology for commercial refrigerator use.

A prototype currently being trialled in a refrigerated drinks cabinet is using 14 watts compared with the 40 watts used by a fluorescent tube in a standard refrigerator. The prototype reduces power consumption, imposes a smaller heating load on the refrigeration system and reduces the risk of food spoiling.

The LED lighting unit can either replace a fluorescent tube, or be mounted outside the refrigerated section of the cabinet.

At freezing or near-freezing temperatures, fluorescent tubes produce only a fraction of their normal light output while using just as much electricity. The Poly Optics lighting system overcomes this inefficiency and is expected to have a lifetime of 100,000 hours - 12 times longer than fluorescent tubes.

The technology eliminates the need for glass within the refrigerating unit, avoiding the potential for broken glass contaminating food products.

Poly Optics is currently seeking a commercial partner in the retail food industry to undertake "real world" trials of its refrigeration lighting system.

Anyone interested in trialling the technology should contact:

Eddy Joseph  
Poly Optics Australia Pty Ltd  
Phone: (07) 5520 2222



Poly Optics fridge lighting lasts 12 times longer than standard fluorescent refrigerator lights at one-third the operating cost

## Innovative start-up companies attend EPA commercialisation course

The Queensland Sustainable Energy Innovation Fund (QSEIF) is a Queensland Government program that provides financial assistance to companies developing energy-efficient and sustainable technologies.

While the lack of financial resources is one of the major barriers facing these companies, so too is their relative inexperience in commercialising their ideas. To help address this issue, recently the EPA convened a pilot two-day commercialisation workshop for nine QSEIF recipients.

The workshop was designed to help participants identify better ways to market their innovations and products. It included presentations and videos, and provided a forum for group interaction, discussion and information sharing.

The workshop focused on a range of topics, including the commercialisation process, with emphasis on "who is the customer", the steps to commercialisation, alignment of the product with the market, intellectual property and project management and negotiation.

Participants learned from each other's experiences, and many found they faced similar obstacles in developing and commercialising their technologies. The feedback provided by participants was positive and indicated that similar workshops would be valuable for future funding recipients.

# Bringing out the dead (and other recycling tales)

Discarded office products contribute to the already large amount of waste that goes straight to landfill each year, but many still have a useful life outside the office.

Driven by this knowledge, the EPA's Sustainability Services Unit (SSU) is undertaking a mission to recover, recycle and re-use this valuable "waste".

SSU manager Des Jones said there was no better place to start than the EPA's own offices.

"We want to raise awareness within the Agency that there are certain things we have to do better," Mr Jones said.

"We want to ensure that the EPA's day-to-day business is conducted in an environmentally responsible manner. We must lead by example, implementing sustainability initiatives that reduce our impact on Queensland's environment."

The SSU began by identifying products that could be re-used or recycled, including mobile phones, batteries, CDs, floppy disks, toner cartridges and polystyrene. They then contacted companies that might have use for these products.

Dean Morrissey, Project Officer for Strategic Waste Management, said products such as obsolete mobile phones were valuable in developing countries.

"With mobile phones it was just a matter of finding someone who had the right equipment," Mr Morrissey said.

"We found an organisation that supplied a receptacle and some posters. They collect the phones free of charge and if they're still working, they're sent to third world countries to be re-used."

MRI Australia collects flat batteries, while used CD and floppy disk cases are sent to Reverse Garbage. Corporate Express collects toner cartridges, and Queensland company Quik'n Tuff uses polystyrene to create wall panelling.

"Putting polystyrene into construction, where that building could be standing for hundreds of years, is a great way of re-using a difficult product that doesn't break down," Mr Morrissey said.

Mr Morrissey said the SSU was encouraged by some of its early environmental and financial gains. Through paper recycling alone the EPA saves around \$11,000 a year, and while some of these savings were used to cover the cost of environmentally responsible disposal, he said raising awareness of the alternative to disposal was the most important thing.

"There's definitely savings to make, we're just scratching the surface," Mr Morrissey said. "At the moment, it's about awareness - the greater the awareness, the better the result."

The SSU are pursuing avenues with Queensland Purchasing to set purchasing standards by taking into account the green credentials of suppliers and products, rather than just the cost.

The SSU has also developed the Office Sustainability Tool Kit to help organisations "think green". The CD

contains information about the SSU's recycling centre (including posters and recyclers' contacts), suggestions about how to purchase the correct equipment, a step-by-step approach to developing an office waste management plan, as well as electricity and water conservation techniques.

Mr Jones said environmental and financial savings were available to any organisation willing to invest a little bit of time in finding them.

"I don't think we're really creating anything new at all," Mr Jones said.

"What we're doing is what has already been identified, developed and applied to industry for quite some time but we haven't necessarily been doing it ourselves.

"So this is the prime opportunity to say 'okay, let's do it and show others that it works'."

For more ideas on buying and re-using environmentally friendly office equipment and products, download the Green Office Guide from the federal Department of the Environment and Heritage website: [www.deh.gov.au](http://www.deh.gov.au)



Des Jones (left) and Dean Morrissey at the EPA office in 160 Ann Street, Brisbane, which now collects mobile phones, polystyrene and batteries for re-use or recycling

The Sustainable Industries mission is to help Queensland industries invest, compete and profit sustainably. If you think you may have a project opportunity that could be developed in partnership with the Division, or if you would like to know more about what we do, please do not hesitate to contact us.

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