Innovation in Focus

Volume 1 Spring 2008

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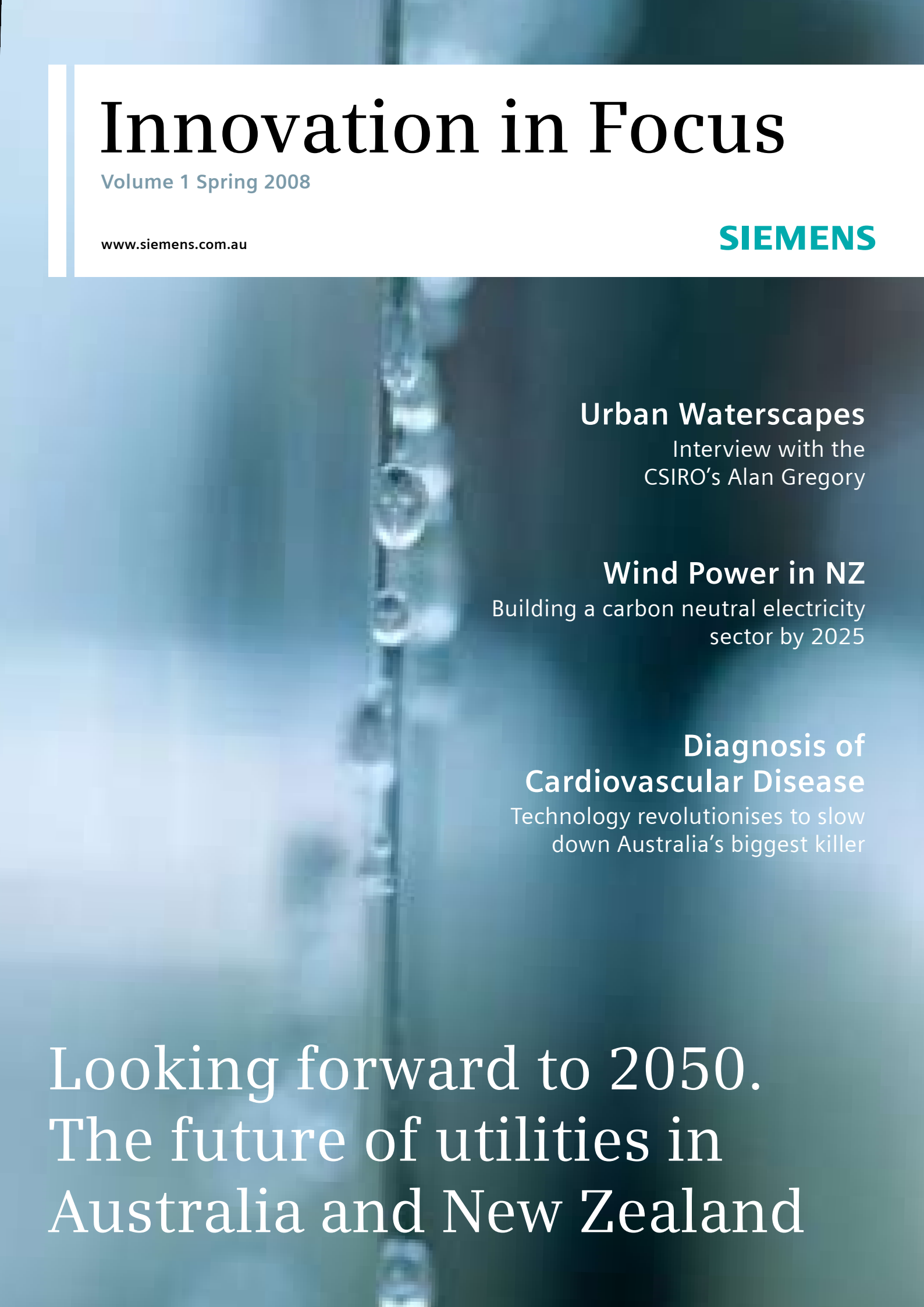

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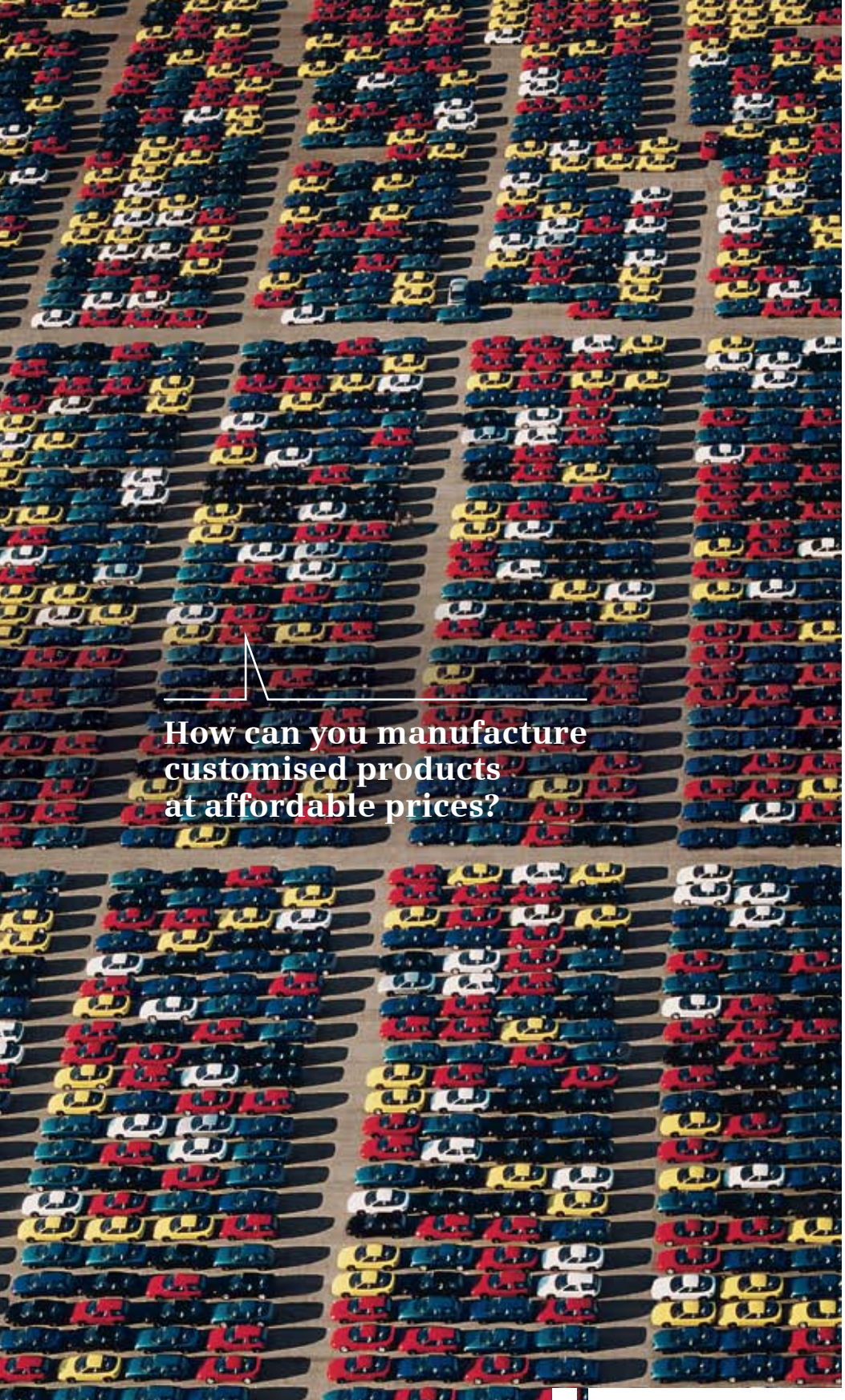

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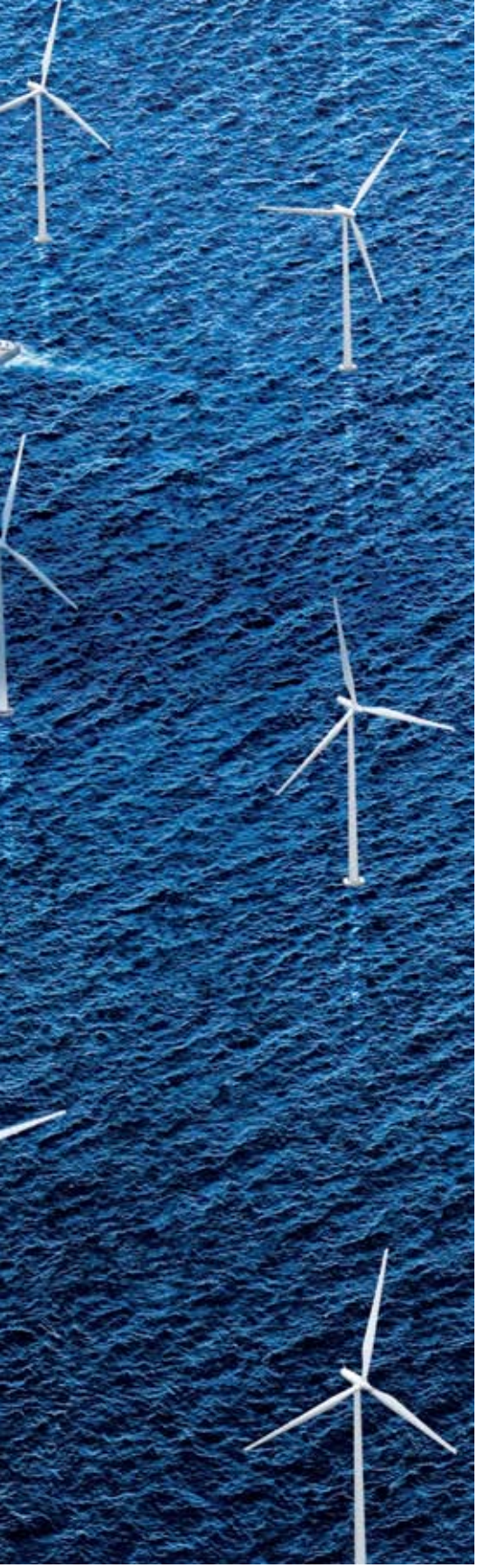

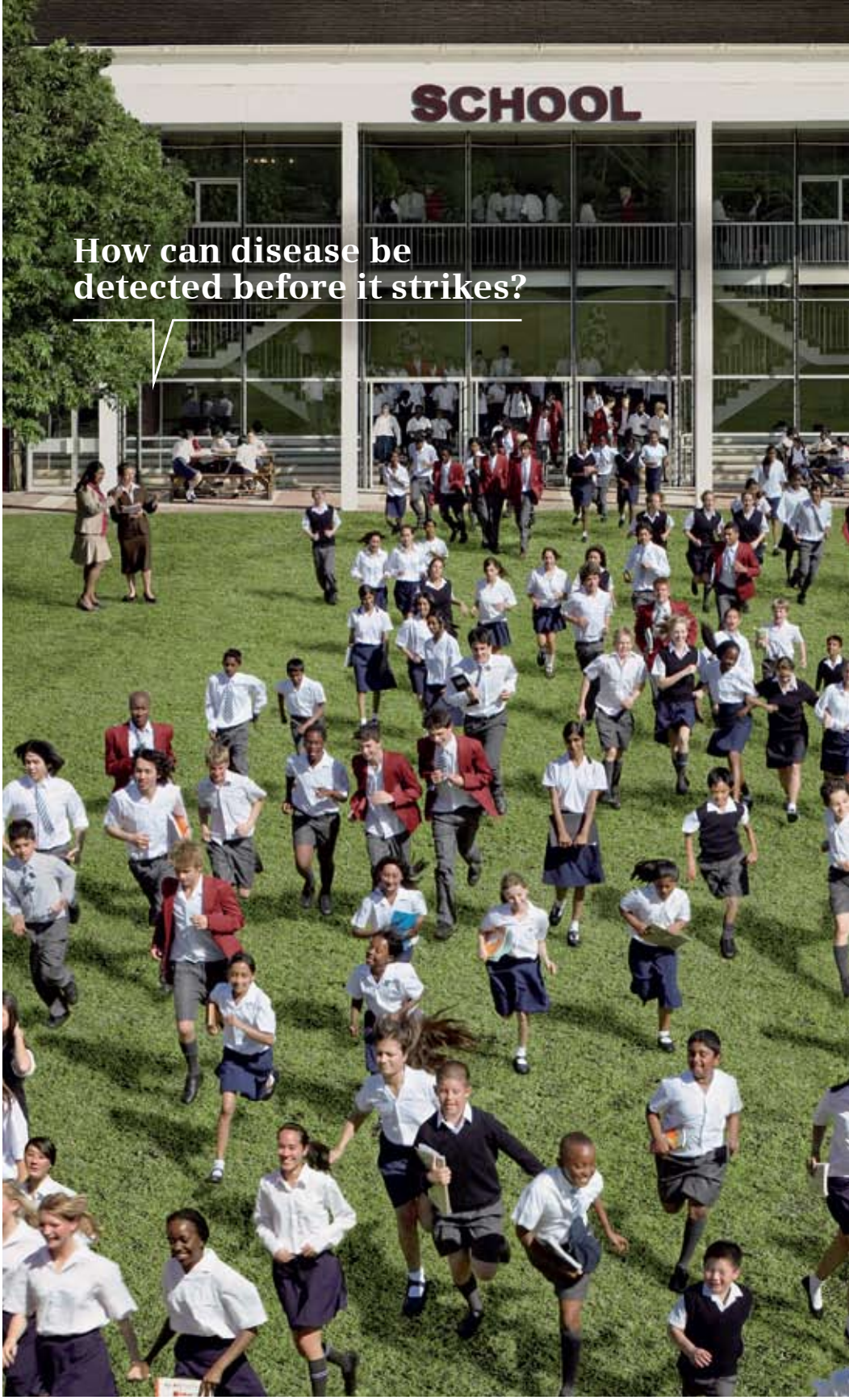

the environment and healthcare.

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From the editor

Let us know what you think of Innovation in Focus and what you'd like to see in future editions by emailing the Editor at email@siemens.com

Like all countries around the world, Australia and New Zealand are facing significant challenges.

Increasing urbanisation, changing demographics, globalisation and climate change are megatrends that will greatly change our world in the coming decades, and challenge us to think in new ways to answer important questions.

How will growing urban populations keep mobile without further contributing to climate change? How will Australia and New Zealand support the increasing healthcare needs of their aging populations? How can growing energy demands be met when traditional sources of energy are declining?

The Siemens portfolio, offering solutions in water, energy, environment, healthcare, productivity, mobility, safety and security, is ideally suited to solving these problems today and in the future.

Recent examples show how leading-edge solutions can overcome challenges arising from the megatrends.

In New Zealand, Meridian Energy recently chose Siemens wind turbines for its 62-turbine West Wind wind farm near Wellington. With a total capacity exceeding 140 megawatts, the Siemens turbines will produce enough electricity to power the equivalent of all the houses in Wellington.

In 2007, Siemens formed a partnership with the Australian Nuclear Science and Technology Organisation (ANSTO) to build a molecular biomarker production facility in Sydney. The new facility will increase the capacity of several hospitals to diagnose and treat patients with life-threatening illnesses.

These two illustrations highlight how our ground-breaking solutions are improving lives in Australia and New Zealand. In this newsletter you'll find a number of examples that show how Siemens is meeting the challenges facing us, both locally and around the world.

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with Albert Goller
Siemens Australia and
New Zealand Managing Director

By 2025, our planet will be home to nearly eight billion people, two billion more than today, mostly living in cities. In addition, life expectancy is increasing in both the developing and industrialised nations.

Significant challenges are arising from these changes around the globe and need to be addressed now. Increasing urbanisation calls for new approaches to providing mobility, water, energy and the other needs. Aging populations need affordable healthcare services, while those in working years need greater productivity to provide products and services. Better ways of meeting growing energy demands are required to protect the environment and save resources.

Innovation is the key to overcoming these challenges in a rapidly changing world.

Siemens Australia and New Zealand offers leading-edge solutions in water, energy, environment, healthcare, productivity, mobility, security and safety.

These solution areas provide the technology, services and infrastructure to solve challenges arising from global megatrends – demographic change, urbanisation, climate change and globalisation.

All the areas are interconnected and create synergies. For example, an environmental control solution for a building saves energy while increasing productivity, safety and security.

Challenges *for a thirsty planet*

Climate change and population growth are making the supply of clean, safe water in Australia and New Zealand more challenging.

Although Australia is the driest continent, it has some of the lowest water prices and the fourth highest per capita water usage in the world. While demand for water is steadily increasing, rainfall has been declining.

A recent survey of the trustees and staff of the Committee for Economic Development for Australia (CEDA) revealed that they believe water is the number one economic issue facing Australia.

Despite perceptions to the contrary, New Zealand also faces challenges in supplying clean water to its growing population. New Zealand outpaces Australia with the third highest per capita consumption of water in the world.

In August 2007, the New Zealand Ministry for the Environment launched a Water Awareness campaign. Environment Minister David Benson-Pope said, "Most New Zealanders would be surprised to learn that New Zealand doesn't have an endless supply of pure water. Some of our rivers are dry, and some of our rivers and lakes are polluted. We may be able to reverse the damage and protect our waterways from now on, but only if we change our behaviour."

Some estimates predict that both Australia and New Zealand will face "economic water scarcity" by 2025. This means that neither country will have the financial or institutional capacity required to increase their water supplies to meet growing demands.

Home-grown technology to save water and protect the environment in Victoria

Currently under construction, the Gippsland Water Factory will be a cutting-edge wastewater treatment plant in Gippsland, Victoria. The first of its kind in Australia, the system will save about three billion litres of fresh water each year, while significantly reducing odour from the 41 kilometre open channel section of Gippsland's Regional Outfall Sewer.

The plant will treat up to 35 million litres of wastewater each day from 15,000 homes, businesses, and Australian Paper's Maryvale mill. Eight million litres a day will be treated to an extra high standard and recycled for use by the Maryvale mill, Australia's largest paper-making complex. The remaining, highly-treated wastewater will be free of organics and odour, and will be sent down the Regional Outfall Sewer.

The Gippsland Water Factory Alliance was formed to design, construct and commission the Gippsland Water Factory. It will also operate the facility for the first two years before handing it over to Gippsland Water in 2010. The alliance is made up of principal sponsor Gippsland Water, Transfield Services Ltd, CH2M HILL and Parsons Brinckerhoff.

The Gippsland Water Factory Alliance chose Siemens to design and supply membrane filtration solutions for the plant, which include Siemens Memcor filters housed in a membrane bioreactor. As an integral part of the plant, Siemens Memcor membrane filters will remove contaminants from the residential and industrial wastewater. The solution will also be able to treat wastewater from the paper mill, which presents additional challenges in recycling.

The technology used to treat the pulp and paper wastewater at Gippsland Water Factory is the first of its kind in Australia and is believed to be a world first, setting a new standard for the treatment of this type of waste.

Wastewater at the plant will be treated in three steps. First, biological treatment occurs in bioreactor tanks. During this step, bacterial organisms feed on organic, food-like substances in the water. The organic matter present in the water is converted to carbon dioxide, water and sludge. This sludge is concentrated in the bioreactor. Over time, the sludge builds up and is removed from the reactor tank to the sludge holding tank. The remaining water moves on to the next stage of the process, membrane filtration.

During filtration, the biologically treated wastewater is separated from the sludge using Memcor membrane filters. Each membrane is similar to a straw with thousands of tiny pores which are less than one-ten-thousandth of a millimetre (0.1 micrometres) in diameter. As part of the membrane operating systems, the membranes clean themselves at regular intervals to remove the sludge so the filtration can continue. After filtration, the water is ready for the third stage, reverse osmosis.

In the final step, the wastewater is filtered at high pressure through semi-permeable membranes which have pores around one-ten-millionth of a millimetre in diameter. The reverse osmosis process removes dissolved pollutants such as pesticides and salts.

Much of the Memcor ultra-filtration (UF) membrane technology used at the Gippsland Water Factory was developed in Australia. The membranes are being manufactured at the Memcor Technology Centre in Windsor, NSW.

A key milestone in the project was reached in March 2008 with the successful testing of the membrane bioreactor for leaks. Two million litres of water from the test was donated to Morwell Golf Club, one of the water factory's closest neighbours. The target date for commissioning the facility is late 2008 and it is expected to be operational early 2009.

Intelligent energy

Both the world's rapidly increasing population and climate change mean more intelligent ways to produce and consume energy are required.

By 2030, global energy demand will be 60 per cent greater than current levels. It is predicted that more than 80 per cent of the energy produced will still come from finite fossil fuel sources.

Australia ranks eighth in per capita energy consumption among developed countries. Australia's energy consumption was 5.71 TOE per capita (total primary energy supply in tonnes of oil equivalent) in 2002. Overall consumption is expected to grow at 2.2% per year through 2020.

Although the use of renewable energy is increasing, coal-fired plants generate 77 per cent of the electricity produced in Australia.

New Zealand has the eleventh highest per capita consumption of energy of the developed countries. Energy consumption is 4.53 TOE per capita which is just below the OECD average of 4.67 TOE per capita. Statistics New Zealand cite New Zealand's large manufacturing base, cold climate, high standard of living, and low population density as factors contributing to its high energy consumption.

In 2006-2007, New Zealand's hydro and wind generation rose by 1,930 gigawatt hours (8.6 percent) and provided 61 percent of total electricity generation. During that year, 68 percent of electricity sold to consumers was generated using renewable resources.

In 2002, among developed countries, New Zealand had the third highest proportion of its electricity produced by geothermal and other alternative methods (these exclude hydroelectricity). Iceland, which uses geothermal, and Denmark, with a high number of wind farms, were number one and two respectively.

“Responding to the risk of climate change is a 100-year challenge. This is not the five-year or ten-year challenge that our political process is used to. It will take decades to change the global infrastructure for energy in a way that preserves economic growth.“

– David Byers, CEO, Committee for Economic Development of Australia

By processing oils and fats obtained from local homes and restaurants, the energy needs of thousands of households can be met.

Technology delivers treasure from trash in Austria

Used cooking oils and frying fats might appear to be useless by-products of food production. But this isn't the case in the town of Dornbirn-Stöcken in Austria.

"Treasures in the Trash", an article by Andrea Hoferichter in the Siemens Pictures of the Future magazine (see www.siemens.com/pof), explains how a cogeneration (combined heat and power) unit in the town converts frying fat and cooking oils into electricity and heat, thus eliminating reliance on fossil fuels.

The project is the product of a partnership between Siemens and environmental services company Wirkungsgrad Energieservice GmbH.

A Siemens office in Vienna was the general contractor for the construction of the facility as well as two other similar plants in the region, which are the first of their kind in Europe.

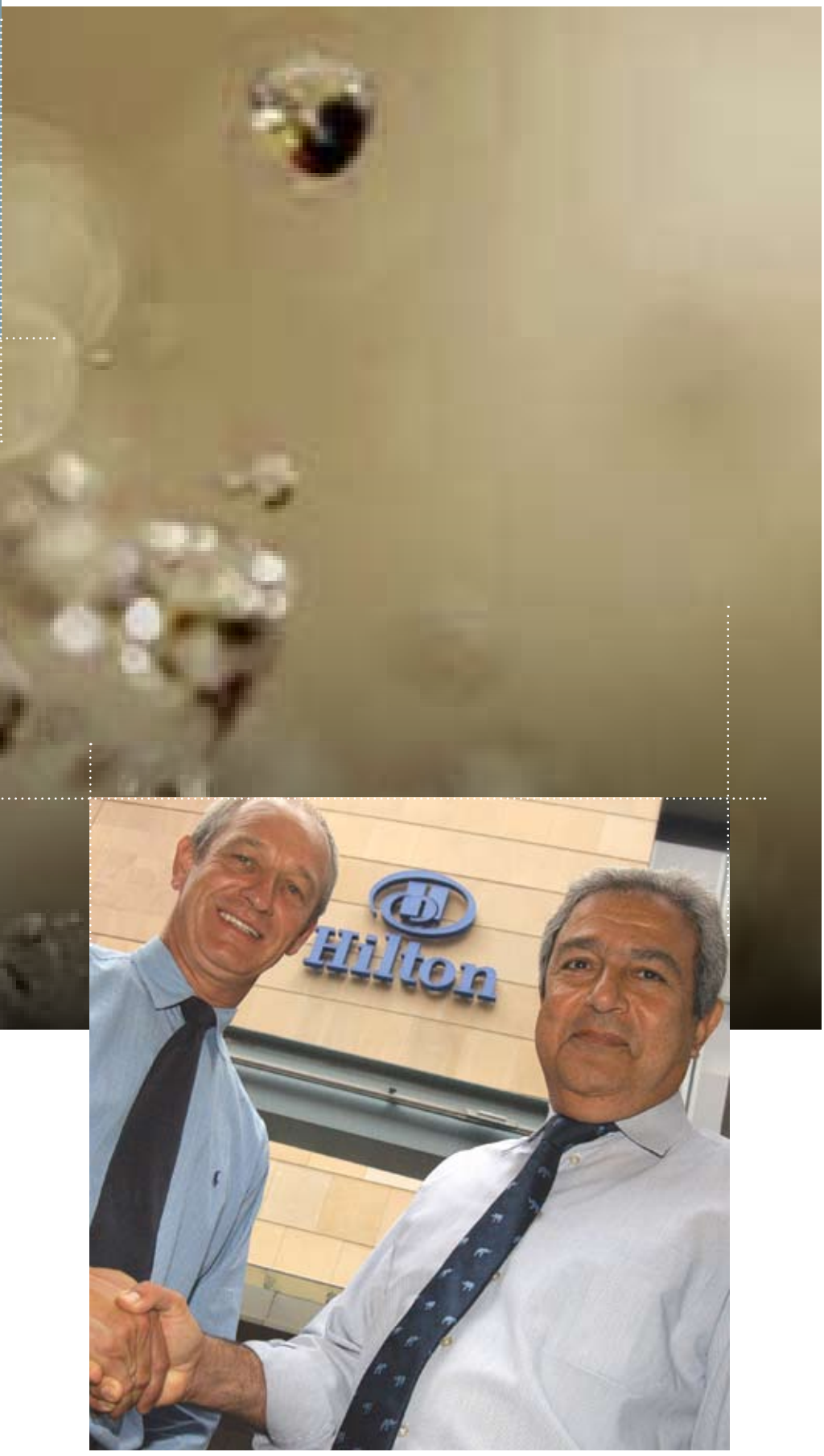
Three giant eight-cylinder heavy oil engines use the processed waste fat to power three generators that together produce 4.5 megawatts of power. Siemens software controls the processing of oils and fats obtained from homes and restaurants. The electricity generated, and heat emitted by the engines, can meet the energy needs of thousands of households. A planned residential complex and neighbouring industrial facilities will benefit from the power and heat generation in the future.

Harold Loos from Siemens said, "We delivered the complete power supply system and the automation technology for everything from the power plant itself to the control system and associated services."

One of the biggest problems is the free fatty acids which can quickly corrode steel piping and other steel components in the plant's motors.

"But thanks to a process developed by our project partner Wirkungsgrad Energie-service, we've been able to hold down the content of the aggressive components to around five percent of the total," Mr Loos said.

The three plants have performed so well that similar facilities will soon be built in other countries.



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Energy and cost savings for Sydney Hilton

The Hilton Sydney re-opened in July 2005 after an 18-month, $200 million reconstruction including installation of a Siemens building management system.

The building management system incorporates the latest Siemens technology to control heating and cooling for the entire hotel. The system is integrated with other building services such as lighting, electricity, hydraulic and gas monitoring, and the customer booking system.

Siemens Project Manager, David Turnbull, said the main technology challenge was to run the building more efficiently while connecting the building management systems with the customer booking system.

"When a guest checks in or out of the hotel, the fully automated building management system instantly adjusts the air temperature upon the guest's arrival or turns the air-conditioning off altogether when the guest departs," he said.

"Energy consumption is therefore cleverly mapped to the hotel occupancy rate, with energy wastage at an absolute minimum."

Sydney Hilton Sydney's investment in Siemens building management systems technology has delivered a 50 per cent saving in energy costs for the hotel.

Hilton Director of Engineering Australasia, George Mansour, said the Siemens system has been highly cost effective for the hotel.

"The systems are simply more efficient and less expensive to operate," Mr Mansour said.

"Our investment in Siemens building management systems reduces energy and also supports our goal of energy conservation and environmental protection. The systems respond swiftly to guests' needs, which is a competitive advantage in this business. This will ensure fewer guest complaints and more return business for the Hilton," he said.

One year after reopening, the Hilton Sydney won the 2006 Best Redeveloped Hotel Award from the Australian Hotel Association and the 2006 Best New Hotel from National HM (Hotel and Accommodation Management) Awards for Hotel and Accommodation Excellence.

Environment-friendly sewerage treatment for Sydney Water

'Sydney water chose a Siemens solution to assist them to clean local waterways and control the digestion of bio-gas.'

Surrounded by Sydney Harbour National Park, Sydney Water's North Head Sewerage Treatment Plant has to meet the highest standards set by the Department of Environment and Climate Change. The plant must have minimal impact on the delicate ecosystem and not hinder tourism in the national park.

In recent upgrades to its North Head Treatment Plant, Sydney Water Corporation (SWC) sought the most environmentally-friendly solutions. One part of the upgrade was a new biosolids facility that uses methane gas to power a 1,400kW cogeneration unit. The unit produces green energy and reduces the amount of power used from the electricity grid to run equipment at the plant.

"We estimate this will save Sydney Water approximately AUD$500,000 per year and produce green energy credits that will contribute to SWC's target of being carbon-neutral by 2020," said Ian Gabriel, a plant manager with SWC.

An essential part of the gas utilisation program is digester gas, which results from the digestion of biosolids. One of the challenges faced by SWC was finding the best storage solution for holding the gas. The system needed to be able to withstand potential bushfires while meeting height limitations and not detracting from the scenic environment.

To meet these requirements, SWC's contractor recommended installing a Siemens Dystor Digester gas holder system. The system uses two separate membranes for optimal performance in digesting biosolids and storing the resulting methane gas. An outer membrane is cable restrained and remains inflated in a fixed position. The inner membrane moves freely as it stores or releases digester gas. A preset operating pressure is

The Dystor Bio-Gas Holder can hold up to three times more gas than alternatives.

The Siemens answer: An efficient energy conversion chain with the world's most efficient combined cycle gas turbine, saving up to 40,000 tons of CO_2.

Delivering environmentally friendly energy means: generating and transmitting power more efficiently while enabling a reliable distribution. Being the only company worldwide that offers solutions covering the entire energy conversion chain, we develop innovative ways to reduce emissions: for instance the world's most efficient gas turbine which will enable the combined cycle plant in Irsching, Germany to save up to 40,000 tons of CO_2 per year while powering a city of 3 million people.
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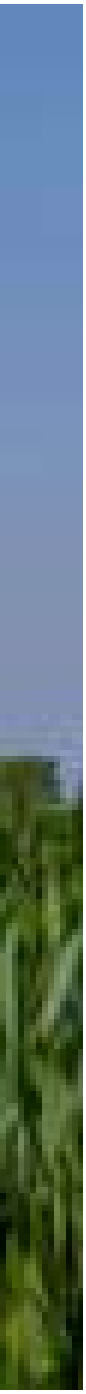


Protecting our environment

Climate change is having a profound impact on the world's environment. These effects include more frequent droughts and bushfires, rising sea levels, and species extinction.

Over the past 30 years, the Earth has warmed by 0.6° C, and over the past 100 years, it has warmed by 0.8° C. According to NASA scientists, the warmest years of the past one hundred were 1998, 2002, 2003, 2004 and 2005. Much of this warming is due to greenhouse gas emissions.

Australia has the highest per capita level of greenhouse gas emissions in the developed world. This has been attributed to electricity generation from coal, road transportation, and the production of non-ferrous metals such as aluminium.

The Australia Government recently announced the Clean Energy Target (CET) of 30,000 gigawatt hours of low-emissions energy generation by 2020 to reduce greenhouse gas emissions.

The Minister for the Environment and Water Resources, Malcolm Turnbull, said, "The CET will be an expanded scheme to include the broad range of clean energy technologies that will be essential if Australia is to successfully manage major reductions in its greenhouse gas emissions, for example, geothermal, carbon capture and storage, solar and wind energy."

Siemens technology for a carbon-neutral New Zealand

Siemens Power Generation (PG) will supply its most advanced wind power technology to New Zealand to support it in its goal to build a carbon-neutral electricity sector by 2025

Recently the New Zealand government announced its ambitious plans to fight climate change. The goal is that the country's electricity sector will be carbon neutral by 2025, with 90 per cent of supply to be generated from renewable energy sources.

Wind power will play a major role in achieving these targets.

State-owned Meridian Energy Ltd, New Zealand's largest electricity producer, is already supplying more than one third of New Zealand's electricity demand, based on hydro and wind power only. Recently, Meridian ordered 62 Siemens turbines for its West Wind project. Located 15 kilometres west of the state capital Wellington, West Wind will be New Zealand's largest wind farm.

The official West Wind groundbreaking took place on 27 September 2007, and was attended by Prime Minister Helen Clark. The farm has an energy generation capacity exceeding 140 megawatts (MW), which is sufficient to power all the homes in Wellington when the wind is blowing.

In her speech at the ceremony, Prime Minister Clark said, "Good renewable energy resources are often located far away from where the demand for them is. West Wind is different.

Turning of the first sod at the Makara site near Wellington, New Zealand. Left-right: Head of Siemens Wind Power Division, Andreas Nauen; Mayor of Wellington, Kerry Prendergast; Prime Minister of New Zealand, Helen Clark; Meridian Energy CEO, Keith Turner; and Te Ati Awa representative, Sam Jackson.

It is on the doorstep of a major city. There will be few cities in the world, let alone capital cities, which can generate renewable electricity from within their boundaries."

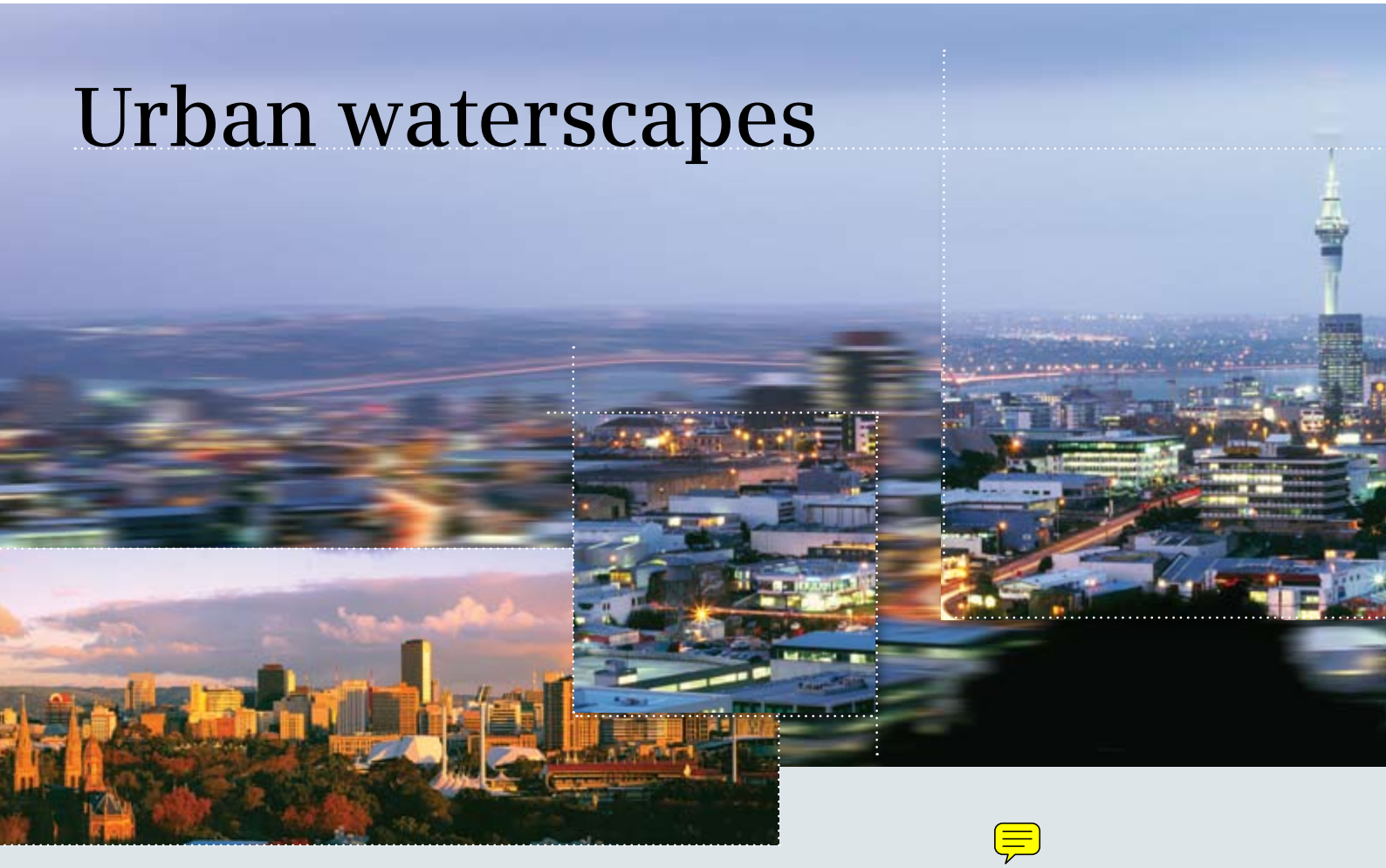
The new order from New Zealand is the first large order for Siemens Wind Power from the Pacific Region. The 62 turbines for the West Wind project have a capacity of 2.3 MW each and will be delivered at the end of 2008. The order includes installation, start-up, project management and a two-year service agreement. The wind farm is expected to start full commercial operation in the second half of 2009.

"Siemens technology will play an important role in building a carbon-neutral energy sector in New Zealand", said Andreas Nauen, Head of the Siemens Wind Power Division. "We will deliver our most advanced wind power technology to support New Zealand's plans for climate protection. Our wind turbines are reliable, cost-efficient and climate friendly, and will help to secure a sustainable future energy supply in the Pacific region and on a global scale."

Siemens (NZ) Managing Director, Paul Ravlich, said Siemens was proud to be working with Meridian on the West Wind project, which is the largest wind farm contracted by Siemens in the southern hemisphere to date.

"New Zealand is a world leader in setting targets for reduced CO_2 emissions via the introduction of renewable energy sources. Wind power projects such as West Wind will be critical in achieving these goals," Mr Ravlich said.

Urban waterscapes



Innovation in Focus **spoke with Mr Gregory about urban water in Australia and CSIRO's Water for a Healthy Country Flagship.**

What is CSIRO's Water for a Healthy Country Flagship?

Alan Gregory: Water for a Healthy Country is one of nine CSIRO research flagships. The intent of the flagships is to address the national research priorities, and water is one of those priorities. The Water for a Healthy Country Flagship is broken up into four themes: Better Basin Futures, Healthy Water Ecosystems, Urban Water and The Water Resources Observation Network.

There are around 100 researchers involved in the program. Most of our research is actually co-invested research with industry partners. A large proportion of that is government partners but we do a lot of work with private industry as well. The focus of the research is quite broad – everything from large scale regional integrated modelling down to nanotechnology applications in water.

What do you see as the major challenges to supply water to Australia's urban areas?

Alan Gregory: There have been a lot of decisions made over the last few years about augmenting supplies and there has been a strong focus on demand management for a nearly a decade now. In the near term most of our cities are grappling with what it means to manage a diversified system. The introduction of desalination, recycling schemes, changing the actual water use characteristics through demand management initiatives, and the uptake of distributed or decentralised systems through rainwater tanks and grey water recycling, are starting due to land use planning requirements and incentives put in place by governments.

In the near term, the real emphasis of all this is finding solutions on how to manage these changes. One of the real challenges is that we've had a linear system for as long as we can remember but we're starting to close the loop on the way we manage water resources in our cities. This means that the complexity of the systems will increase considerably. Now we have a mix of both rain-fed and non-rain-fed, or manufactured, water options. Even the basic modelling of how we predict future demand and supply is becoming more complex, so there's a large focus on getting better decision support systems in place, getting better integrated modelling of both supply and demand, and looking at the implications of that for overseeing water quality.

In the short term, it's really just learning how to implement these integrated systems in a way where service standards are not compromised while we continue to provide high quality service to urban communities.

What about long-term challenges of supplying water to cities.

Alan Gregory: In the longer term, there are a whole range of issues emerging. Water-energy relationships are becoming more important as we move towards manufactured (desalination and recycling) water solutions. There's a lot of concern about energy usage and the impacts of that on greenhouse gas emissions.

CSIRO has been heavily involved over the last few years in downscaling the global climate

Alan Gregory is the Theme Leader of Urban Waterscapes, part of CSIRO's Water for a Healthy Country Flagship. Mr Gregory has over 30 years' experience in water and wastewater infrastructure, planning and acquisition. He has a Master of Management from Macquarie University and brings an industry perspective to CSIRO's water research.

model predictions down to a regional scale to predict what the local impacts of climate change might be on water supplies and urban runoff. We're also doing some work on the demand side of the equation. Based on historical demand patterns, we're trying to understand how climate change might affect the demand for water.

There's a whole raft of other issues that haven't really been explored yet. Things like the impacts of climate change on bushfire risk, on the changes in forests, especially in Sydney and Melbourne where you have got natural catchments. Forests respond differently to changes in CO_2 levels and to changes in temperature, so the risk of major bushfires in those catchments is significant or will significantly increase. This has pretty severe implications for those cities if that is the case. You only got to look at what happened to Canberra a few years ago to see how if you took out a reservoir you'd have a major issue on your hands in terms of managing the water supply. And that's not just in the medium or short term after a bushfire, its in the long-term regeneration of a forest using a lot more water than it traditionally did.

Also in the very long term things like seawater rise might have implications for ocean outfalls, particularly in cities with major waterways like Sydney. If we are recycling a lot more in the future, increasing salt levels in those sources would cause major problems for recycling. I don't think any those issues have really been explored fully yet.

How do you see megatrends such as demographic change affecting the supply of urban water?

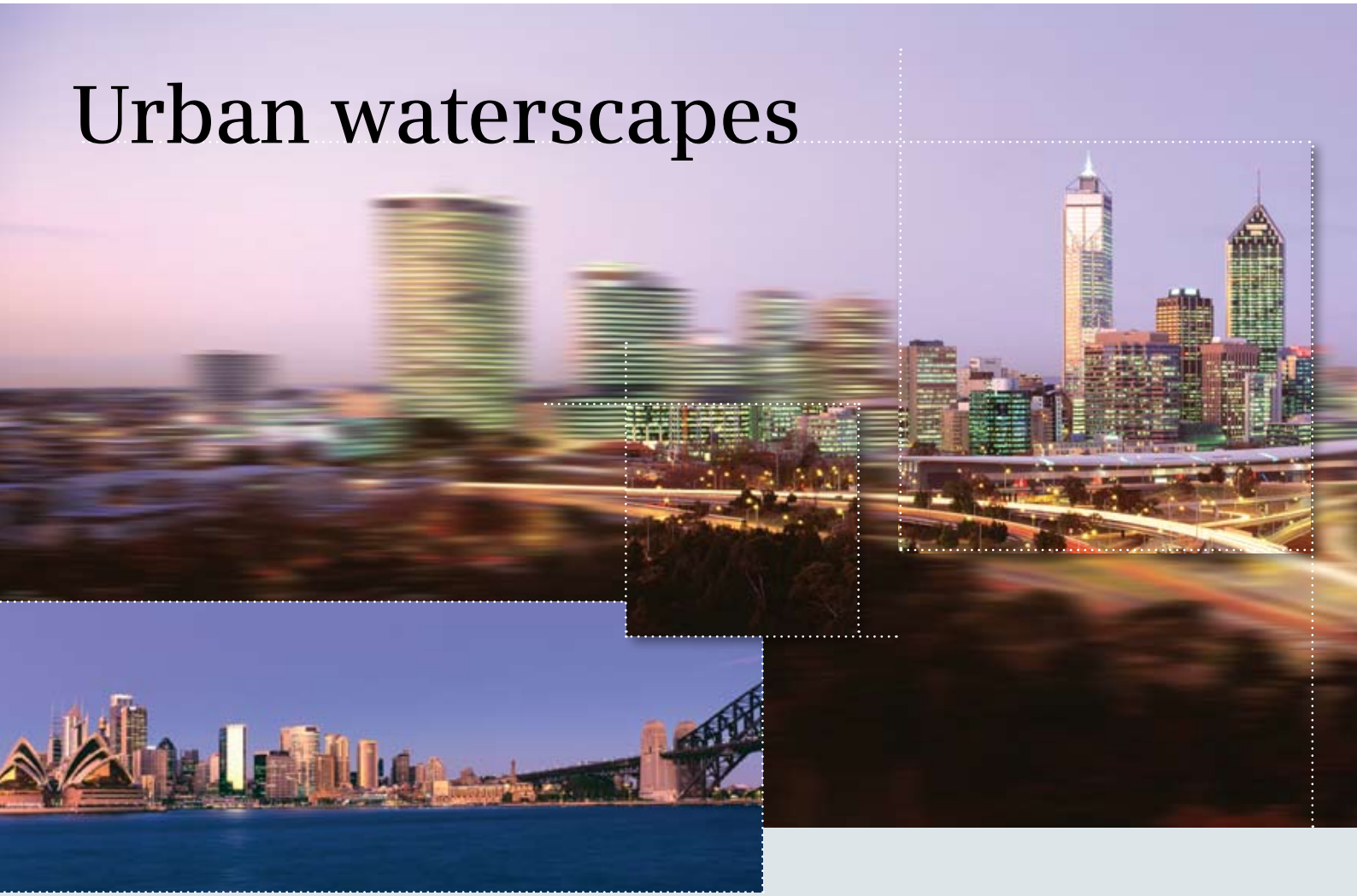
Alan Gregory: Demographic change is occurring as our cities are becoming more dense. More people are moving to apartments and there is less development on the fringe. The urban planning rules over the last few years have changed quite dramatically to encourage resource efficiency of both energy and water in development. As we move more to high rise developments, particularly in Sydney and Melbourne, we'll see the uptake of decentralised systems more prominently in our cities. It's the inevitable outcome. As the treatment technology improves and the application of some of those technologies to small-scale applications gets better, the uptake of those systems will occur.

Are you talking about local recycling systems, such as within an apartment complex?

Alan Gregory: Yes. It's already quite common in some countries, such as Japan, where they do it on a fairly routine basis. At this time the emerging issues around the uptake of these decentralised systems is getting the model right. At the moment the uptake of rainwater tanks and grey water recycling systems is fairly much left to the end user to manage. I don't think that's necessarily a sustainable, long-term solution to providing water services in a different way. I guess it's up to the private sector to come in and offer some of those services in a total package solution.

It's fairly difficult to do at the moment because the price of water is relatively low. But if the prices of water and energy go up, I think these alternatives will grow in the market. It's almost inevitable because there are a lot of advantages to decentralisation. Certainly you don't need mega investments in large plants; you can incrementally implement some of

Urban waterscapes



these solutions. You can tailor them more to the local conditions, but it's important to get the model right in providing these services.

It's a challenge for the government to understand what the opportunities might be and how they would regulate and price them in the context of the overall centralised systems. We've traditionally had a utility mentality and maybe that's starting to be challenged a bit more. In the short term the challenges are not necessarily technical, they're more institutional.

What type of research is being conducted by the Water for a Healthy Country Flagship?

Alan Gregory: We've been conducting climate change research for some time. On the energy-greenhouse front we're been working in a few areas. One project is on quantifying the total system water-energy relationships. There's been a lot of focus on desalination as a high energy solution to water supply in our cities. But if you look at it in context of an overall city, we use less than one percent of our residential energy on a per capita basis for water supply. Residential water heating is more than five times that amount. So if we went to 100 per cent desalination in some of our cities we'd only increase that one per cent to about five per cent of residential energy consumption.

I think that one of the things that really needs to be looked at closely by governments is the relationship between water and energy policy decisions. You might be able to offset some of the more energy intensive desalination/ recycling type solutions simply by having good energy policy such as promoting systems such as solar hot water.

Part of our focus is to look at the broader perspective, or systems approach, to make sure you are targeting the right things. And the other has been more of the micro level looking at low energy treatment technologies such as membrane clusters.

The membrane cluster is an example of that where we've set a challenge to say what can we do about reducing the energy demands of desalination particularly through membrane treatment. We've brought together nine universities from around Australia and a lot of the best membrane scientists from in the country to focus on making a breakthrough in that area. They're focusing primarily on new membrane materials. Some of the other universities have brought in people who haven't traditionally worked in water treatment technology but most of them have had some experience in gas separation and related fields. So we're adapting some of the skills and techniques that have been applied elsewhere to water treatment.

In Queensland we're evaluating storm water harvesting and other alternatives. It's a fairly holistic project looking at every alternative we can think of. We've also done some interesting work in using aquifers in Adelaide. We've taken storm water runoff from the urban environment, captured that water, filtered it and injected it back through one of the local aquifers to produce water of a drinkable quality. That's the first project of its kind in Australia.

One of our bigger projects is the work on

purified recycled water in Queensland.

This represents about a quarter of our research program. A prime focus of this is indirect recycling scheme that they're going forward with. One of the big projects there is looking at the water quality implications right across the seven treatment barriers. Our particular focus is on the upstream end. We're studying the implications of what is coming through the sewer system going into the treatment processes and also at the other end of the system, quantifying what the impacts on the reservoir are after injection into the dam. We're not just looking at the health issues, but also the ecological impacts of putting that highly treated water into the natural environment.

On the demand management front, we've been doing some work on better ways to monitor water use in cities. One of the big gaps in knowledge at the moment is how people actually use water. There's been a lot of work on demand forecasting over the last few years leading to an end user-based demand forecasting approach mainly to help design demand management programs. But one of the big information gaps is how people use water. When we supply one product to the front gate, you didn't need to know how people used it beyond that master meter. That's becoming a more critical issue. There are a lot of things that flow out from that knowledge. Not just demand forecasting but also understanding parameters for design of decentralised systems, how people respond in drought, and a whole range of knowledge flows out of better induced metering. The long-term vision is to be able to install smarter meters in sufficient numbers across the city to be able to monitor and calibrate some of our forecasting.

We're probably the strongest research group in Australia in the area of asset management. We've done a lot of work on understanding the degradation and failure mechanisms in pipelines and climate-soil interactions, and we have developed tools for long-term performance prediction. These tools have been taken up by quite a few utilities in Australia.

We're thinking beyond that now and asking how will changes in demand patterns with the uptake of recycling schemes and the introduction of small-scale systems throughout parts of a city will affect existing assets. It's a question that seems to be bubbling up to the surface among many of the utilities who are getting a little nervous that some of these alternatives will actually accelerate the rate of degradation of existing assets.

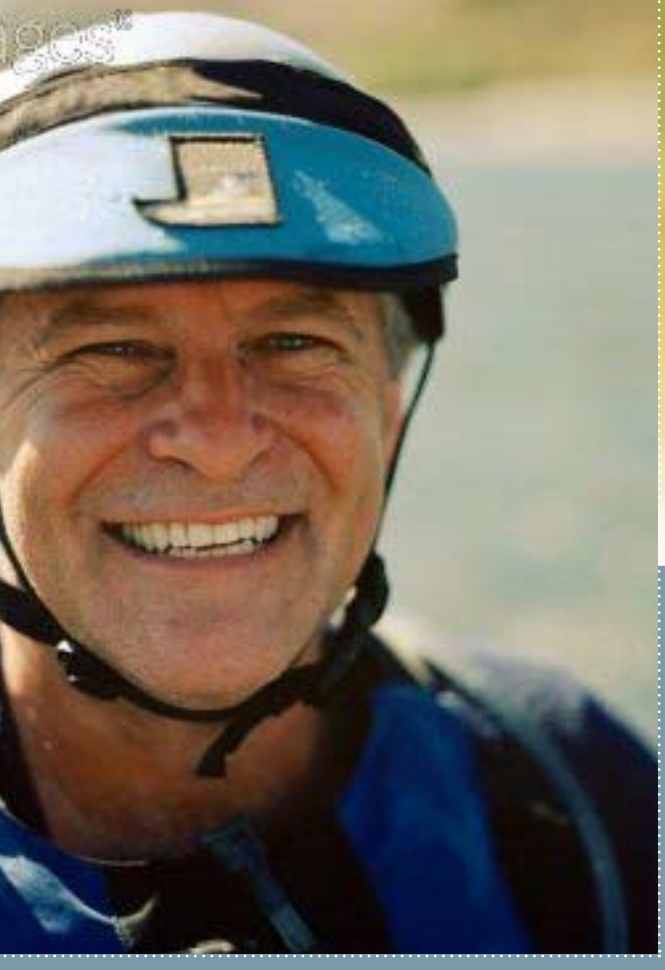
For example, flows to wastewater treatment plants are down by 30 per cent in Queensland due to water restrictions. Besides not having enough water to put through their recycling plants, there are reductions in flows in the wastewater system but not to the concentration of pollutants. There's significant potential for greater odour generation and for more aggressive flows through the pipes. This produces acids that eat away at the inside of the pipes. There's a whole range of issues that are starting to emerge and we look forward to using the tools and techniques we've developed to predict these impacts.

For more information visit the CSIRO's website at http://www.csiro.au/org/HealthyCountry.html

Economic implications

for an ageing nation

By 2045, it is expected that 25 per cent of Australia's population will be over the age of 65.



Many countries around the globe will soon experience large increases in the proportion of people aged over sixty five.

This means that demand for healthcare will grow while the financial resources to provide services will decline due to a lower proportion of the population in working years.

By 2045, it is expected that 25 per cent of the Australia's population will be over the age of 65. This is double the current proportion.

In Economic Implications for an Ageing Australia, the Productivity Commission concluded that population ageing "will give rise to economic and fiscal impacts that pose significant policy challenges."

One of these challenges is an aggregate fiscal gap of around 6.4 percentage points of GDP by 2045. The report noted, however, that "more cost-effective service provision, especially in health care, would alleviate a major source of fiscal pressure at its source."

New Zealand faces similar demographic challenges. Currently, 12 percent of all New Zealand residents are 65 and over. By 2051, this will have risen to 26 per cent of the population.

New technology revolutionises diagnosis

Cardiovascular disease is the leading cause of death in Australia. About two thirds of unexpected cardiac deaths occur without prior recognition of cardiac disease. In the case of life threatening events like heart attack, aneurysm or stroke, swift diagnosis and treatment are key to survival.

In Brisbane, a strategic alliance between the Mater Private Hospital and Qscan Radiology Clinics, a private radiology provider within the hospital, delivers world class technology for faster and more accurate diagnosis and treatment of patients with cardiovascular disease.

The alliance combines the Siemens SOMATOM Definition Dual Source Computed Tomography (CT) Scanner at Qscan with a Siemens Artis Zee Bi-plane flat panel detector at the Mater Private Hospital CardioVascular Unit.

Until recently, cardiac imaging was only feasible if the patient's heart rate was adequately low and stable. Standard single source CT scanners required the use of medication called beta blockers to slow the heart rate enough for imaging, or multi-segment reconstruction where smaller data sets are acquired in consecutive heart cycles. Also, as data sets of different heartbeats have to be combined and coronary arteries move between each cardiac cycle, the resulting image loses quality.

The SOMATOM Definition Dual Source CT system overcomes these challenges by using two x-ray sources and two detectors at the same time. This leading-edge solution greatly reduces the time needed for cardiac imaging while eliminating the need for drugs or invasive procedures.

"If a patient presents with undiagnosed chest pain at our Emergency Department, the treating doctor can obtain rapid access to diagnostic cardiac images through the Siemens Dual Source CT scanner at Qscan and a determination can then be made as to whether the patient requires further interventional procedures through the Mater Private CardioVascular Unit," said Don Murray, Mater Private Hospital Executive Director.

"There are no other set-ups currently like this in Queensland and very few in Australia. It is a potentially life-saving combination that saves precious time when every second counts."

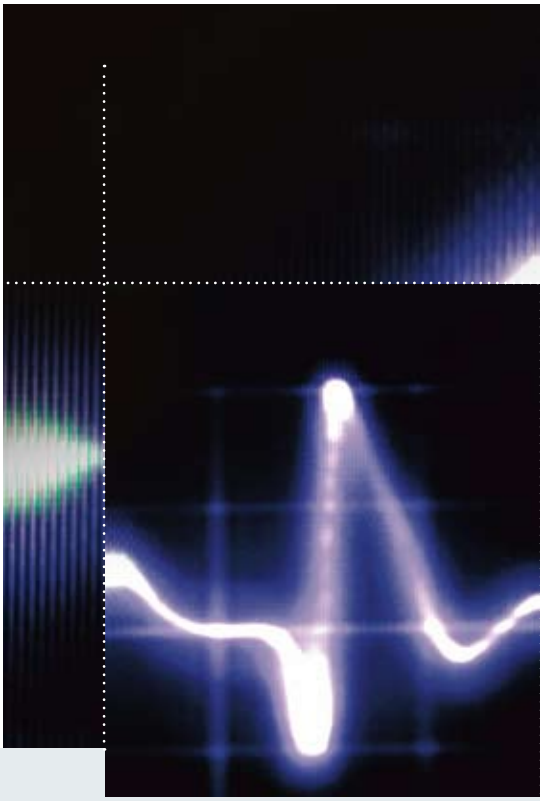
According to Cardiothoracic Radiologist, Dr Mark Hansen, the Siemens Dual Source CT Scanner is a non-invasive procedure that quickly provides a clear and accurate 3D image that facilitates prompt diagnosis

"The Siemens Dual Source CT Scanner takes images of the heart as it beats, thereby removing the need for certain types of procedures. For example, heart patients no longer require beta blockers to slow the heart rhythm to ensure clearer images. Also, the imagery is so precise there is no need for angiography, which is an invasive x-ray examination of blood vessels or lymphatics following an injection of a radiopaque substance," Dr Hansen said.

The installation of the Siemens Artis Zee bi-plane flat panel detector at the Mater Private CardioVascular Unit is a first for Australasia and completes the journey for the patient if further treatment is required.

"This new generation bi-plane flat panel detector is the most advanced model of its kind and enables clinicians to perform complex interventional cardiac procedures," Mr Murray said. "It is faster, safer and ultimately better for the patient."

"Cardiovascular disease kills one Australian every ten minutes and with technology such as the Siemens Dual Source CT Scanner and the Artis Zee bi-plane flat panel detector continuing to advance, we are in a much stronger position to tackle this growing community problem," he said.



International expert leads coronary CT angiography life training masterclass

In May 2008 Dr Harald Seifarth, a renowned international researcher, speaker and radiologist at the University of Münster, led a training masterclass as part of the Siemens Life program about Coronary Computed Tomography (CT) Angiography for cardiologists, radiologists and radiographers at the Siemens offices in Sydney. The 2-day workshop comprised a combination of lectures, hands-on training, mentored case reviews and video demonstrations to strengthen the knowledge and skills for this potentially life-saving diagnostic imaging procedure.

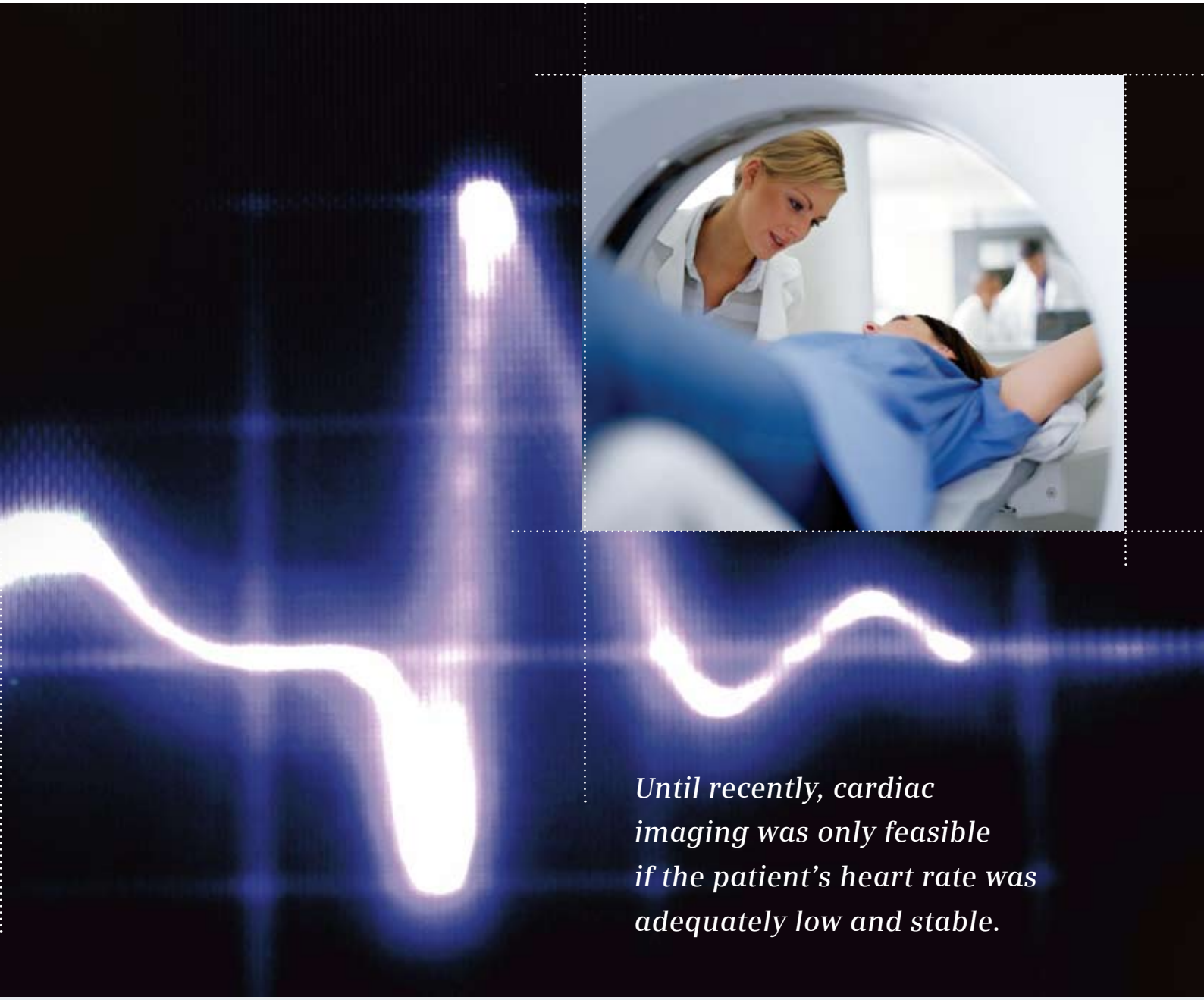
Coronary CT Angiography (CTA) is a medical imaging technique used to visualise the heart and its blood vessels to diagnose heart disease. This technique has undergone rapid evolution and is becoming ever critical because of its potential to provide non-invasive, accurate and quick diagnostic evaluation of patients suffering from chest pain.

Anil Gupta, Business Development Manager for Siemens CT, said, "Cardiovascular disease is the number one cause of death in Australia so this type of medical imaging is absolutely critical in the diagnosis and prevention of heart disease.

"Through this Life Training Masterclass, we're helping radiologists, cardiologists and radiographers perform better scans using leading-edge Siemens CT scanners."

The workshop covered many facets of Coronary CTA including protocols and reconstruction

# of cardiovascular disease



Until recently, cardiac imaging was only feasible if the patient's heart rate was adequately low and stable.

techniques, the appropriateness criteria for ordering Coronary CTA and workstation operation. Attendees also studied examples of normal and abnormal Coronary CTA anatomy.

This training masterclass is one of the initiatives offered to Siemens customers as part of Life – a program dedicated to provide continuous learning and education to customers in the healthcare industry.

Gupta explained the benefits of the Life program in advancing healthcare for Australia and New Zealand.

"Cardiovascular disease is the number one killer in the world and the ability to diagnose it quickly can save lives. Proper training in Coronary CT Angiography is therefore necessary to learn how to perform these scans properly, prepare patients effectively, interpret and report accurately.

"The Life program ensures our customers keep up to date with technology developments and new techniques through continuous education. The Life program offers various education offerings such as regular users forums, clinical workshops, symposiums and online learning to help broaden the knowledge of our customers and utilise their Siemens systems most effectively.

"We see our customers as our partners, therefore our services extend beyond providing state-of-the-art technology. It's also about providing value added services such as the Life program to support their ongoing growth," said Gupta.

Perspectives on Australia's

Australia and New Zealand face significant challenges in maintaining and increasing productivity levels. Geographical distance from trading partners and small populations result in lower economies of scale, less competition and higher transportation costs.

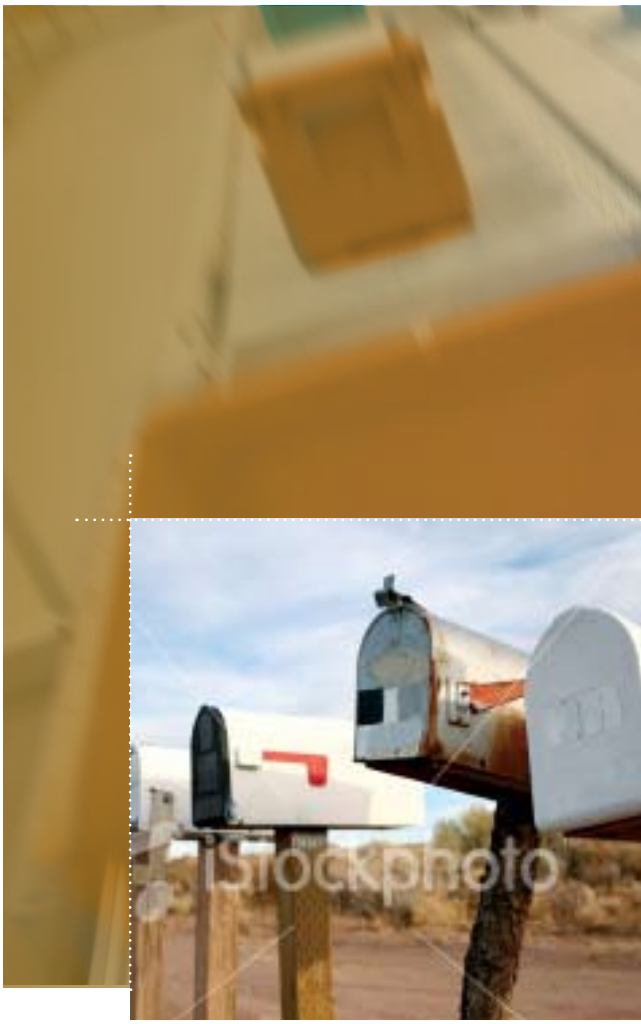
In addition, demographic change will see higher proportions of the population no longer in working years.

In Perspectives on Australia's Productivity Prospects, an Australian Treasury Working Paper, Graeme Davis and Jyoti Rahman examined possible reasons for the productivity gap between the US and Australia. Over the past four decades productivity in Australia has been between 75 and 85 per cent of the US.

The authors note that "this productivity gap can at least in part be explained by a combination of differences in: capital per worker, educational attainment, microeconomic policies, and the geographic and historic context in which the two economies operate."

According to the paper, economic reforms have helped lower the productivity gap and raise Australia's productivity level relative to the global technological frontier.

Davis and Rahman conclude that "reforms are likely to improve Australia's steady state level of productivity relative to the frontier, while, in the long run, Australia's productivity growth will be determined by technological progress at the frontier."



Global postal automation trends

The global trend in postal automation has four major facets. First, due to ever increasing cost pressures and stagnating letter mail volumes in almost every country in the developed world, postal services are keen to automate every single processing step in their postal logistics chain.

This is good news for automation technology suppliers and postal services because it keeps physical mail competitive against other communications methods, such as email. One of the best and most prominent examples of this is delivery point sequence sorting, which is high-speed automatic sorting of letter mail – and even flats – into the most efficient and productive delivery sequence for posties. This eliminates the most time-consuming and costly manual processes, and lets posties focus on the job of delivering mail.

The second major facet deals with information content on the surface of mail pieces, including parcels. In the past only the receiver's address was the focus of automatic address recognition solutions, but today all information on the mail piece is of interest to postal services. From sender address recognition for automating the forwarding process – one of the most cost-intensive steps in the process chain – to automatic stamp value recognition for protecting revenue, everything can be automatically read and recognised – at high speed and accuracy.

The third facet goes along with IT. Information technology is increasingly indispensable to integrate the highly complex postal logistics chain and to improve its overall performance.

The fourth aspect applies to the more inconspicuous things in postal automation that often have a significant positive impact on performance by transforming innovative ideas into upgrades to the installed machinery base. Voice coding for parcels is just one example of this. By combining manual coding with voice recognition, the performance and efficiency of manual coders is greatly increased.

All four trends are vital for meeting the increasing demand for speed, performance, reliability and accuracy. As a high-tech supplier of postal automation solutions, Siemens is well prepared to deliver solutions to current and future challenges.

productivity prospects

Boosting productivity at Australia Post

Australia Post needed a way to process increasing numbers of large mail items (called flats). The challenge was to find a solution that could provide the highest possible address read rate with the widest possible variation in flat size.

Siemens designed and built 80-metre flat sorting solutions machines which operate in Melbourne, Sydney, Brisbane, Perth and Adelaide. The fully-automated solution uses leading-edge technology to find and read addresses on mail pieces and compare them to a database of 20 million addresses in split seconds. The sorting machines can process up to 27,000 pieces per hour, enabling Australia Post to effectively handle a growing volume of flats.

The machines can read handwriting as well as machine fonts. If the handwriting is particularly hard to read, a video image of the address is relayed to an operator who assists the machine in dispatching the flat to the right destination.

Juergen Schneider, General Manager of Postal Automation at Siemens, said the postal automation project was the most ambitious ever undertaken in Australia.

"It is an inspiring example of making the investments of Australia Post better through outstanding technology, business process knowledge and the efforts of a great team of people," Mr Schneider said.

To achieve the successful installation of such advanced equipment, Siemens and Australia Post created a single project management team with representatives from both organisations. The team members were located in the same project office. The single team concept made communication between project members as quick and efficient as possible.

"These machines are best practice. With their totally integrated automation and robotics they are the leading technology in the world," said Jim Marshall, Australia Post General Manager Mail Network Division.

Since being installed, the sorting machines have generated a significant return on investment by halving downtime.

Partnering up for the best solution

Siemens Solution Partner program combines local knowledge with global expertise

As the world's population grows, more people are demanding high quality products at affordable prices. In addition, globalisation has increased competition among organisations aiming to meet customer needs. Collaboration among businesses is vital for gaining a competitive edge. The Siemens Solution Partner program is one example of how collaboration between Siemens and its partners delivers tangible benefits.

By Peter Dixon
National Channel Program Manager

In a fast changing world, businesses are faced with increasing competition and commercial uncertainty which promotes independence. Despite these trends, partnerships can still thrive. Trust and loyalty between organisations can grow. One example of this is the Siemens Solution Partner program.

Our Solution Partner program relies on total cooperation between three main stakeholders: Solution Partners, end users and Siemens to ensure a successful project delivery from conceptual design to commissioning and full operation and even further into ongoing asset management.

In the Siemens Solution Partner program, potential partners are carefully evaluated over a period of time. Once all parties are satisfied, a rigorous training and certification process begins ensuring that the resulting Solution Partner is qualified to the highest global standards. These standards are recognised worldwide.

One of the main benefits of the Solution Partner program is the combination of the local knowledge of markets and industries by our partners with the global expertise and technical excellence of Siemens. This combination delivers advantages to Solution Partners' customers and end users, who achieve greater productivity with state-of-the-art solutions.

The latest, optimally-configured technology implemented by Siemens Solution Partners increases efficiency and profitability. In addition, end users receive a high level of investment protection because the solutions are highly adaptable to future challenges and developments.

Each Solution Partner offers different competencies that cover a wide range of tasks. This gives customers access to optimum solutions for specific needs – from configuration and commissioning to service. Every partner, along with their profile, their certified competence and their service portfolio, can be found on the internet using the 'Partner Finder' on the Siemens website. This gives customers an overview of the products and services offered by each Solution Partner, so they can easily find the ideal provider for their requirements.

We believe that our Solution Partners are almost part of our organisation so we have to be sure that together we can deliver quality outcomes. While our partners carry great responsibility, we also have a great responsibility to our partners. It is paramount that we continue to develop their expertise and maintain their 'toolkit'. We need to be certain their resources are satisfactory and their personnel are happy.

The Solution Partner program started four years ago in Germany and now thrives across the globe. The program was introduced into Australia and New Zealand two years ago. Since then it has developed into a vital delivery mechanism for Siemens. More importantly, it has enabled all of our Partners to expand their portfolios and deliver greater benefits to their customers and end users.

More information on the Siemens Solution Partner program can be found at www.automation.siemens.com/_en/solutionpartner/index.htm.

One of the main benefits of the Solution Partner Program is the combination of the local knowledge of markets and industries by our partners with the global expertise and technical excellence of Siemens.

The Siemens Solution Partner experience

By Mike Lane
General Manger and Director of ICM Group

ICM Group is a total electrical and mechanical engineering solution provider serving industrial, commercial and mining industries in regional and metropolitan locations in Australia and overseas. We became an accredited Siemens Solution Partner for Factory Automation in the third quarter of 2007.

Our business plans from 2005 to 2007 highlighted a need for building stable growth from new market sources and new opportunities. Although our existing products provided satisfactory positive growth, we wanted to be ahead of the game by taking a proactive approach for contingencies and enhancing the ICM Group service portfolio.

We considered various concepts that we steadily and methodically narrowed down to two options: either the acquisition of a complete and packaged 'ready to go' enterprise or embarking on a program of significant development within our business for a new and diversified field of products – a specialty of our own that would evolve internally at ICM Group.

Both strategies required an investment of funds, human resources and dedication. Our primary guiding factor at that stage of the assessment process was to select the solution that would align with our core values, be profitable, be something that we could become very good at, and be rewarding to employees.

We investigated several possibilities before finally embracing the 'development within' option, setting a focus on the Siemens Solution Partner Program. This combination just seemed to meld perfectly as we progressed through the exercise.

The final stages of the evaluation process involved interviews with key personnel from Siemens. We carried these out at various levels, extending from state and national to international regions. We needed to be sure that the Solution Partner Program would work for us.

Then we embarked on a program to conduct extensive market research and formulated strategic plans in conjunction with Siemens that eventually gave us the confidence to expect a new, exciting, sustainable and profitable division of our business.

The initial Solution Partner accreditation process required an assessment of ICM Group's suitability by Siemens. This was followed by specialised training, practical and theory examinations and submission for review of successfully completed projects based on the relevant Siemens products.

Although this seemed a little drawn out and challenging at times, it highlighted the fact that potential Siemens Solution Partners need to be of a necessary stature and dedicated to the process and overall program, eliminating the possibility of watering down the status and significance of being an accredited Siemens Solution Partner.

We embraced the program's concepts and become passionate about the possibilities. This spurred us on to complete the steps required as soon as we could. Once accredited, we capitalised on opportunities by getting the word out to industry and have since had a steady stream of projects.

Siemens Solution Partners gain the greatest benefits from the program through regular communication with their Siemens product managers and the Solution Partner team with the intent of fostering trust through collaboration and results. We believe a unified and directed approach to the market has a greater potential to compete against other integrators for more favourable results. Drawing in needed expertise from Siemens has resulted in very satisfactory outcomes.

"A successful transport system must be sustainable in all its aspects. In the economy, it must deliver for industry and users in a sustainable way. Socially it must meet our needs for access and mobility in a sustainable way. And environmentally it must deliver a system which has as low a carbon footprint as possible."

– Rt Hon Helen Clark, Prime Minister of New Zealand

Mobility technology

driven by climate change

Australians drive an estimated 199 billion kilometres per year and own 619 motor vehicles per 1000 people, the fourth highest per capita in the world.

Contrary to the popular belief that Australia's green house gas emissions from transportation are high because of the large distances separating major urban centres, most of Australia's passenger transportation occurs within, not between, urban centres (around 72 per cent of total car travel occurs in urban centres, and only 5.5 per cent is for interstate travel).

Statistics New Zealand estimates that between 1979 and 1998 the annual total vehicle kilometres travelled in New Zealand more than doubled. Kilometres travelled in cars, light commercial vehicles and heavy commercial vehicles have all increased, while cars are the largest contributor to the number kilometres travelled.

In both Australia and New Zealand, carbon dioxide emissions resulting from increased vehicle travel per year directly affect the environment.

In addition to climate change, increasing urbanisation, and declining reserves of fossil fuels need to be addressed when developing future mobility solutions.

A locally-designed solution for smoother rail operations

Points operating equipment is used to safely change the lie of railway turnouts to allow trains to change tracks. Traditionally, points operating equipment has been housed in the spaces between railway sleepers. This hinders the use of high production rail tamping machines and results in long-term maintenance and reliability problems.

Siemens Australia has developed a solution to overcome the shortcomings of conventional point operating technology. Called the OneTrough Point Operating System, it integrates all points equipment in one hollow sleeper. The trough is installed in place of a sleeper and provides secure housing for the equipment. This enables the use of high production tamping machines through the turnout area.

Siemens Engineering Manager, Dwayne Allan, said the point operating technology was designed specifically to suit the needs of the Australian railway market.

"Originally we imported all the equipment from Germany but the new local design and manufacture is far more cost effective for customers. We call the new operating system OneTrough because all the equipment can be housed in one trough sleeper," Mr Allan said.

"Customer response to our new OneTrough offering has been excellent, with additional orders received just on the basis of the prototype," he said.

The first order for the new equipment was recently installed for QR (Queensland Rail) at the Dalrymple Bay coal terminal, the primary coal port for QR's Goonyella coal system south of Mackay.

The OneTrough Point Operating System is manufactured in Australia, which delivers cost savings to customers.

Developing intelligent traffic lights to save lives

In its white book issued at the beginning of the millennium, the European Union set the goal of cutting road deaths by 50 per cent by 2010. Although safer than in many other parts of the world, there are roughly 40,000 road deaths annually in Europe.

The latest issue of Siemens Intelligent Traffic Systems (ITS) Magazine explores a European Union initiative to develop a virtual alliance between vehicles, infrastructure and control centres.

The aim is to create cooperative systems which involve real-time exchange of data. "In simple words, intelligent traffic lights should soon be able to 'talk' with vehicles, in order to increase the safety of all road traffic participants," the article states.

Standardised protocols, such as WLAN (wireless local area network) and UMTS (universal mobile telecommunications system) will link the systems.

For example, vehicles could transmit information on their position and speed via WLAN at intervals of one second or less. Intersection controllers, possibly supported by other roadside detection devices, will create an accurate image of the situation.

"This will enable early recognition of imminent collisions or dangerous traffic rule violations so that suitable counter measures can be initiated: from transmitting warnings to road users involved up to direct intervention in traffic control systems," the article explains.

"In addition, the more precise an detailed situation overview will include weather conditions, road surface conditions, visibility or obstructions – further important information that can be transmitted to the road users in order to defuse potentially dangerous situations in good time and prevent accidents."

The EU plans to spend a total of € 30 million (AUD 48 million) on the development of communication between vehicles, infrastructure and control centres. More than 50 renowned companies and institutes have been cooperating on the project since February 2006. Project partners include automobile manufacturers and companies in communication technology, road traffic technology, road network operations and sensor technology.

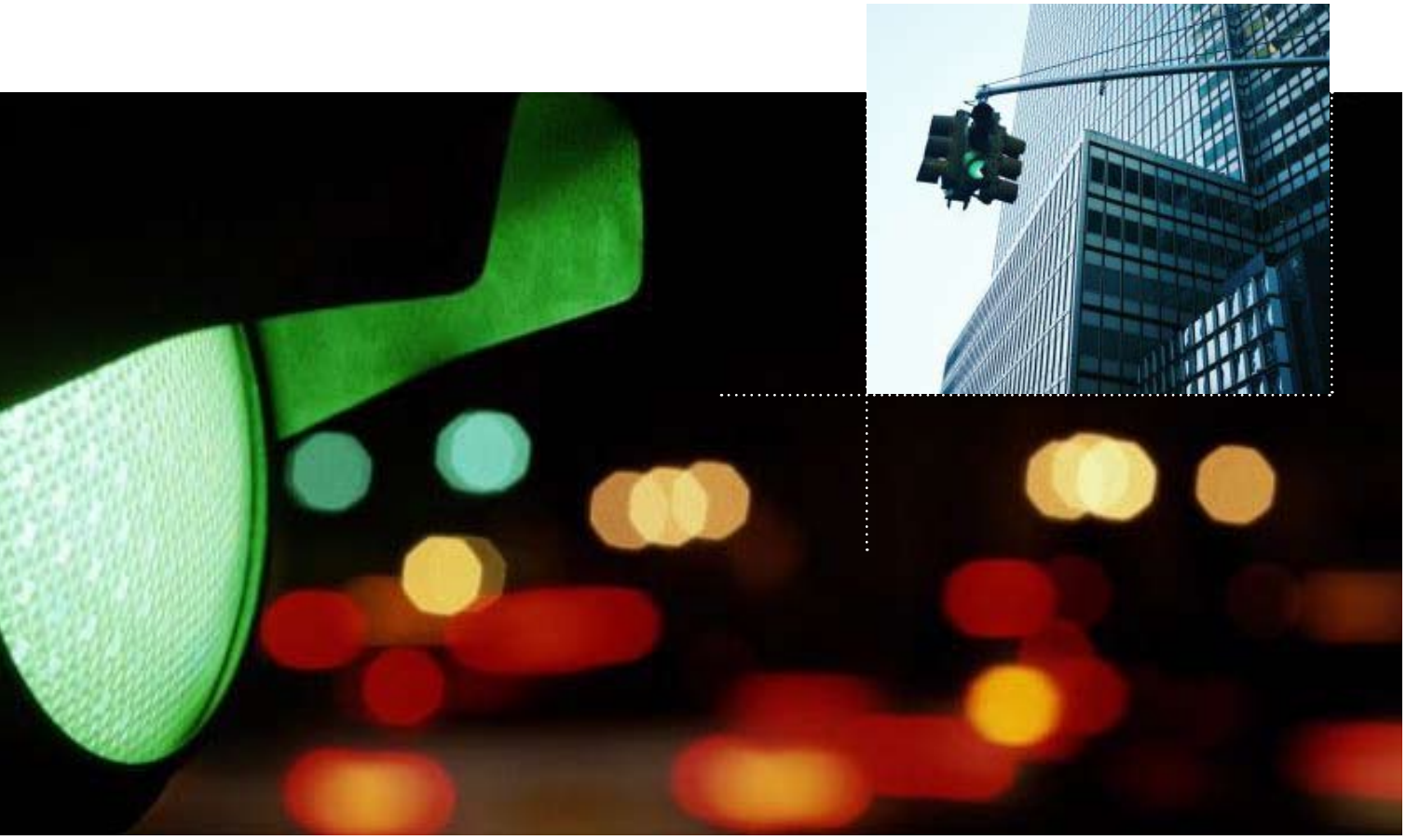
In close cooperation with Munich Technical University (TU München), Siemens ITS is creating a "safe intersection" and demonstrating its operation at a testing field in Dortmund, Germany.

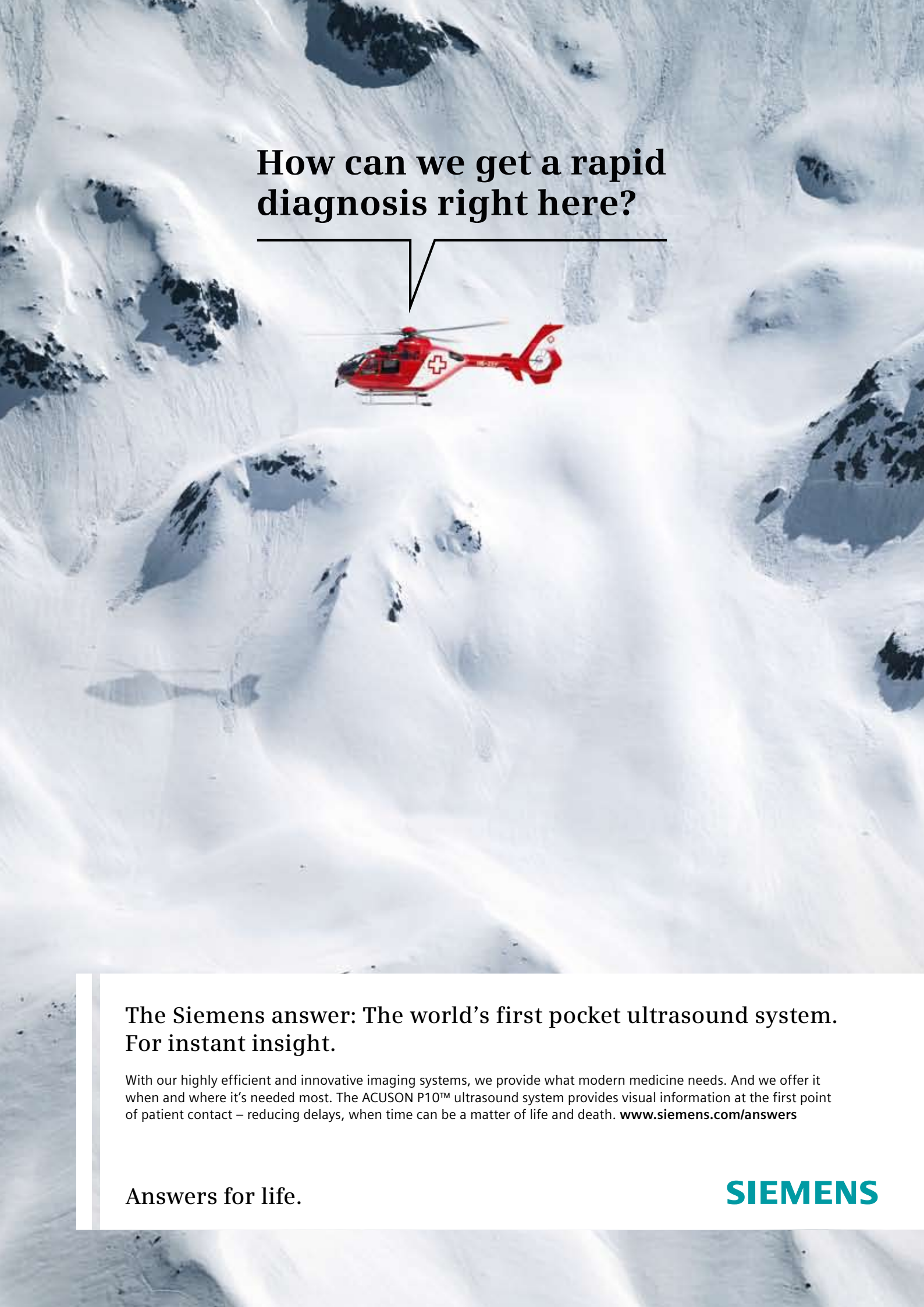
Professor Dr Fritz Busch of TU München described the project.

"The vehicle driver's scope of perception is to be expanded both in time and space, so that they become aware as early as possible of safety-critical road traffic conditions and situations."

The safe intersection will use a safety application called CICPS (Cooperative Intersection Collision Prevention System), which continuously monitors the traffic-light controlled area and takes appropriate measures in dangerous situations.

Researchers at TU München are devising the corresponding programs and algorithms. Siemens ITS is responsible for integrating the procedure in the newest generation of traffic light controllers, installing the system in Dortmund, and organising testing. Demonstrations of the technology in realistic surroundings are planned for 2009.





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Innovation and utilities: Looking forward to 2050

by Kate O'Keefe
South East Water

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Innovation and utilities: Looking forward

As part of the Australian Innovation Festival 2008, the Innovation and Utilities Conference was hosted at Siemens Australia and New Zealand Head Office on 27 May 2008.

Sponsored by the Australian Innovation Festival, South East Water, Siemens and 'us' Utility Services, the conference focused on several facets of innovation with speeches and workshops covering the culture of innovation, product and service innovation, and innovation and sustainability. The event included a panel discussion on how utilities will look in 2050.

Albert Goller, Chairman and Managing Director of Siemens Australia Limited, opened the conference and spoke about the megatrends of urbanisation, globalisation, climate change and demographic change. Mr Goller said these megatrends create challenges as well as opportunities for utilities.

Mr Goller expressed the multi-faceted nature of innovation. "We often hear about technological innovation, but I strongly believe that true innovation takes place in three parts. It comes through people, processes and technology," he said.

Bernard Koh, General Manager, of Singapore Utilities International delivered the keynote address that covered Singapore's Integrated Water Resources Management.

Despite substantial rainfall, Singapore is classified as a country of water scarcity due to it small catchment area.

Mr Koh told the conference how innovation has been used to develop alternative sources of water to augment water from local catchments and water imported from Malaysia.

NeWater, is one of these alternative sources. It is water produced from a multiple barrier reclamation process including conventional wastewater treatment, microfiltration, reverse-osmosis and U/V disinfection produces NeWater. Three NeWater factories is have a capacity of delivering 92,000 cubic metres of water per day. NeWater consistently exceeds quality requirements set by the US EPA and the World Health Organisation.

Mr Koh spoke of the importance of collaboration and getting alternative view to foster innovation.

"Each of us is faced with unique challenges depending on the where we come from. Our journey with NeWater doesn't stop when a plant is commissioned. It's an ongoing effort. We have international experts who are an external audit panel coming from all around the world to see what we have done and to share emerging trends," he said.

Workshops throughout the day covered a range of topics including innovation in the workplace, urban water management, the effects of climate change on utilities, implementing innovations, and innovation through collaboration.

In a panel discussion, chaired by Marcus Powe, Entrepreneur in Residence at RMIT University,

industry experts were asked to picture the future of utilities in Australia in 2050.

Terry Laidler, Independent Chair of the Smartwater Fund, said, "We can't keep running on the same energy costs that were running on now. We need to start talking about smarter ways to build physical infrastructure."

Pat McCafferty, Director of Strategy and Communications at Yarra Valley Water, said that many of the predictions made forty to fifty years ago have not come true while there have been great changes in some areas of technology, such as the Internet.

"By 2050 we will have technologies and problems that can't envisage today. We don't want to get locked into a linear way of thinking because history proves that it doesn't work out that way," Mr McCafferty said.

He believes that reliability and sustainability of water will drive decentralised infrastructure in future. "Developers, builders and homeowners are all pushing towards self-sufficiency through rainwater tanks and recycling," he said.

"In 2050 we can expect water and sewerage services that have no environmental impact, and we can expect a proper price on water and sewerage services. There will be some choice for customers for the type of water and sewerage services they utilise. Utilities may still provide a service but it may not be through pipes and pumps," Mr McCafferty said.

Martin Hablutzel, Siemens' National Marketing Manager in Power & Distribution, said that electrical utilities will have to fight to maintain their relevance in the future.

"Utilities are in the balance between environmentally sustainable solutions in conflict with security of supply. Security of supply has always been the main driver of electrical utilities in constructing, rolling out and maintaining the networks. Environmental sustainability introduces new challenges and it's the conflict between these two drivers that is creating challenges that require innovative solutions," Mr Hablutzel said.

Mr Hablutzel said by 2050 the most progress will be made domestic or community spheres if utility companies don't make changes on their network to address the energy issues.

"Consumers and other parties will be taking things into their own hands with respect to having in-home devices which are fed data from a smart meter which tells them what the price of electricity is at that time and chooses whether to run the washing machine at that time or switch it off. These devices will be linked into the weather forecast to start warming the house or cooling it before a change comes through," he said.

"In-home power generation such as photovoltaics and mini gas generation is where I see the major changes taking place. Utilities cant' assume that this will be their domain because the domain of electrical utilities is infrastructure, from generation to the customer and not beyond that point," Mr Hablutzel said.

"Compact substations will be the norm in future, as well as highly interconnected networks, high-voltage DC connections between states, more back to back DC to create power loops, intelligently switched networks based on the smart meter data. There will be heavily imbedded generation and power flowing in the reverse direction," he said.

Grahame Foulger, General Manager of Sustainability & Innovation at Ergon Energy said that by 2050 traditional power might cost 50 to 100 times what is costs now.

Speaking about the future he said, "I'm convinced that our customers will be mini utilities and share electricity with each other. I

to 2050

think the cash cow big utility network will still be in play with probably around 40 per cent of the market, but I see a whole new range of businesses and don't see those in the traditional utilities."

Shaun Cox, Managing Director of South East Water, closed the conference by explaining how collaboration is central to innovation.

Mr Cox showed examples of innovation developed through collaboration between South East Water's employees, partners and customers.

Brain Waves, South East Water's flagship innovation, recently won Victoria's Engineering Excellence Awards for Workplace Innovation. Brain Waves fosters a culture of innovation and culminates each year with the Brain Waves Cup, in which teams convert ideas into business plans. The team with the best plan receives a cash prize. Mr Cox said that Brain Waves has stimulated a powerful change in the culture within South East Water and created a wide range of business plans and ideas.

Mr Cox explained how 'us' Utility Services, an alliance between South East Water, Siemens and Thiess, resulted in an innovation called Hydroshare, a data collection and reporting system that enables customers to track water, electricity and gas usage in real time.

"Hydroshare is a terrific example of collaboration where three organisations bring different elements together to create an innovative product. It gives our customers far greater knowledge of their water consumption. One primary school, for example, discovered a leak by using HydroShare and saved around $1500 per year," Mr Cox said.

Mr Cox said that the water industry members have been good at collaborating among themselves, but that the industry could benefit by broadening its horizons.

"This conference is an example of how we're sharing ideas across industries. Collaboration brings together departments, organisations and people, and helps us see possibilities that we otherwise wouldn't have seen," he said.

Picturing the future of power transmission and distribution

In April 2008 Siemens held a series of interactive workshops titled Pictures of the Future. During the workshops, representatives from power utilities, government bodies and Siemens discussed needs, opportunities and trends affecting reliable and secure power transmission and distribution in Australia and New Zealand.

Anthony Johnston, Siemens Power Transmission & Power Distribution National Marketing Manager, said the workshops demonstrated Siemens' motto 'Innovation for Generations' in Australia and New Zealand "which attests Siemens active involvement in the region for the past, the present and the future."

"During the workshops we talked with our customers about our current technology, and used case studies to describe our past experience and present projects. Current megatrends of urbanisation, climate change, globalisation and demographic change set the scene for discussion of future scenarios for electricity transmission and distribution in 2020 and beyond," Johnston said.

"Research data was presented from earlier workshops we carried out with other global utilities and infrastructure owners, bringing a global perspective to the local market. From this we created a conceptual picture of the future for the Australian and New Zealand energy sector, to use as a basis for discussions on industry trends, organisational needs and other opportunities."

The discussions allowed Siemens and its customers to explore the major factors affecting the reliable and secure transmission and distribution of power in today's climate. Customers offered insights into their business needs and gave valuable feedback on ideas presented during the workshops.

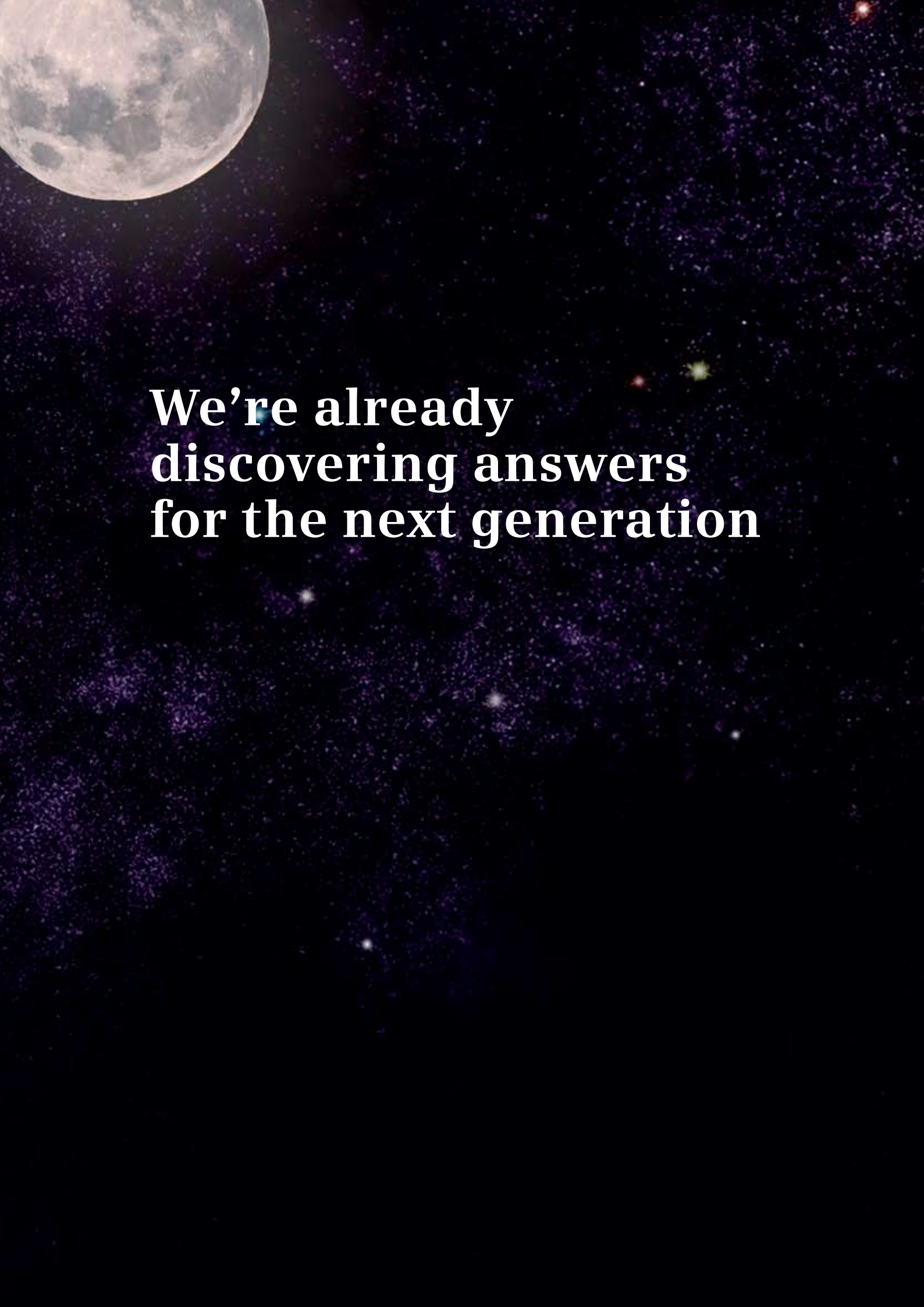
"Australia doesn't have megacities such as Shanghai and New York but we have a small number of densely populated centres separated by vast distances," Mr Johnston said. "This creates unique challenges and raises the question of how to connect these large cities that are far apart and integrate dispersed power generation."

Other major trends discussed were ageing infrastructure, limited numbers of skilled workers, securing energy infrastructure and supplying environmentally-friendly solutions.

Besides trends, major needs as a result of technological change were identified during the workshops. "Traditional electricity networks are structured according to generation, transmission and finally distribution to the end customer. However, distributed generation such as renewables and more complex load, are creating new challenges for designers and managers of networks."

Johnston believes the Pictures of the Future workshops benefited both Siemens and its industry partners. "Customers who participated in Pictures of the Future were pleased that we created a forum to listen to their ideas on the needs and challenges facing electricity networks in the future," he said.

"Understanding these challenges will help Siemens provide the right products and services to deliver complete solutions for the future."


We’re already
discovering answers
for the next generation

At Siemens, we see the big picture. Megatrends are impacting the future of governments, businesses and communities. 1.7 billion people lack safe drinking water, and the world will need 60% more energy by 2030. Climate change also poses very real challenges with storm and geopolitical effects already impacting our major economies. We have 160 years of global experience to solve our biggest challenges, from water, energy, the environment and healthcare to increased productivity, mobility, security and safety. We're creating a future based on imagination and outcomes. www.siemens.com.au

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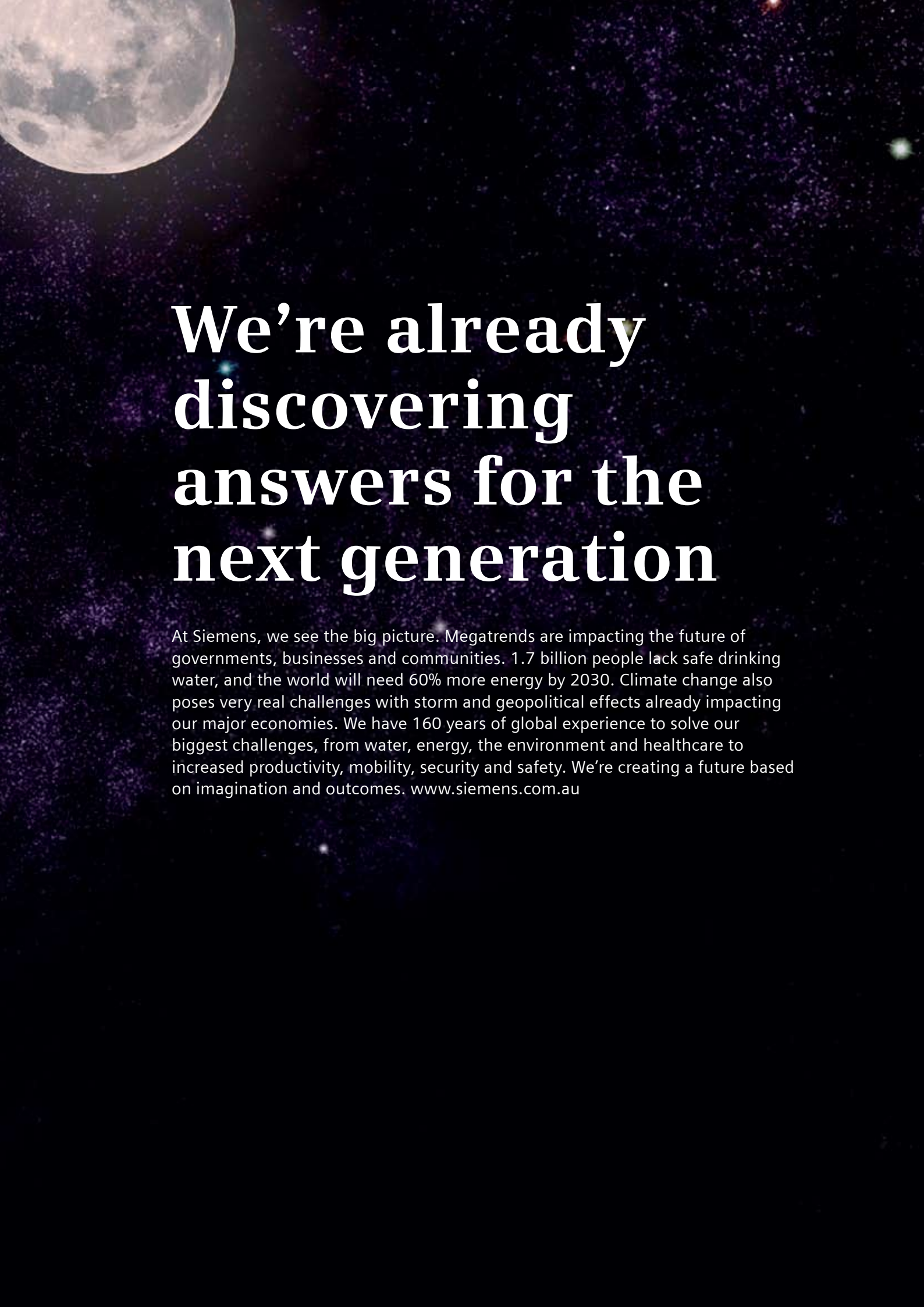

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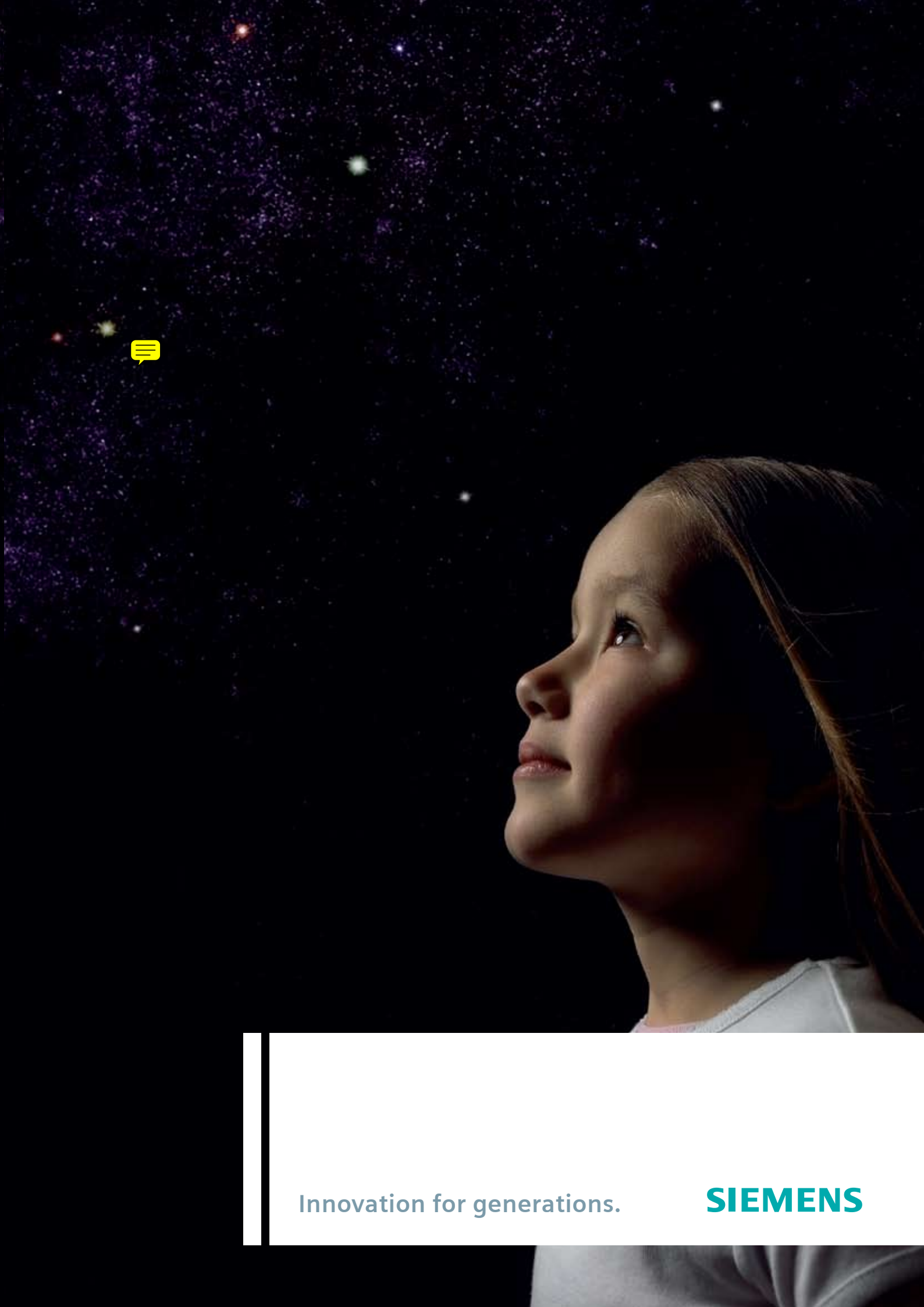

Innovation for generations.

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Safety
the key to improved productivity

In Australia and New Zealand, a growing number of business leaders recognise that safe work places are a prerequisite for productivity and long-term success.

According to Australia's National Occupational Health and Safety Commission (NOHSC), there have been significant improvements in OHS in recent years but there is considerable scope for further progress.

In its National OHS Strategy 2002 – 2012, the NOHSC lists for several priorities to reduce workplace injuries and fatalities. One of these is eliminating hazards at the design stage.

NOHSC statistics show that 37 per cent of workplace fatalities are definitely or probably design related. An additional 14 per cent of fatalities suggest design issues were involved.

A 2004 study by the National Occupational Health and Safety Commission found the some common design-related causes of workplace fatalities were inadequate guarding, poorly situated control devices and inadequate interlock safety systems.

The study calls for greater use of passive safety devices (such as guarding on machinery, safety interlock systems, residual current devices) to prevent workplace injuries and fatalities.

The new Ford Falcon FG on the production line at Ford's Broadmeadows production facility

Integrating safety into the production of Ford's new Falcon FG

The Ford Falcon has been manufactured in Australia since 1960. The longevity of its production makes it the biggest selling brand in Australian automotive history. The seventh generation of the car, the Falcon FG, was unveiled in May 2008.

The design of machinery and plant equipment for production Falcon FG had to meet Ford Australia's rigorous safety requirements and the updated standards under Australian Standard AS4024.1 2006.

One example of where these stringent guidelines have been applied is in the design and operation of the door manufacturing operation in Broadmeadows, Victoria. During door assembly, parts are manually loaded onto a turntable for transfer to the cell where they are robotically spot welded.

Safety devices are seamlessly integrated with control functions to ensure safe operation of the robot welding cells at all times. A light curtain protects the operator by preventing the turntable from moving when parts are being manually loaded.

Other safety devices include emergency stop buttons, which can be activated if a dangerous situation arises, and controlled access gate controls, which cannot be opened until the machinery in the cell has stopped operating.

Siemens Safety Integrated products and systems play a central role in the safe operation of the door assembly robot welding cells. Safety Integrated is the consistent implementation of safety technology in accordance with Totally Integrated Automation, Siemens' comprehensive and consistent product and system portfolio for automation.

Total Integrated Automation reduces expense and saves time because it combines safety and control functions in one integrated system. This makes it possible to connect moving components and safety devices in the door production facility with less cabling. The result for Ford was reduced commissioning time and cost. In addition, Siemens user interface devices give a clear and constant diagnostic picture of both the control and safety functions of the operation.

Environmental control for safe and cost-effective pharmaceutical production

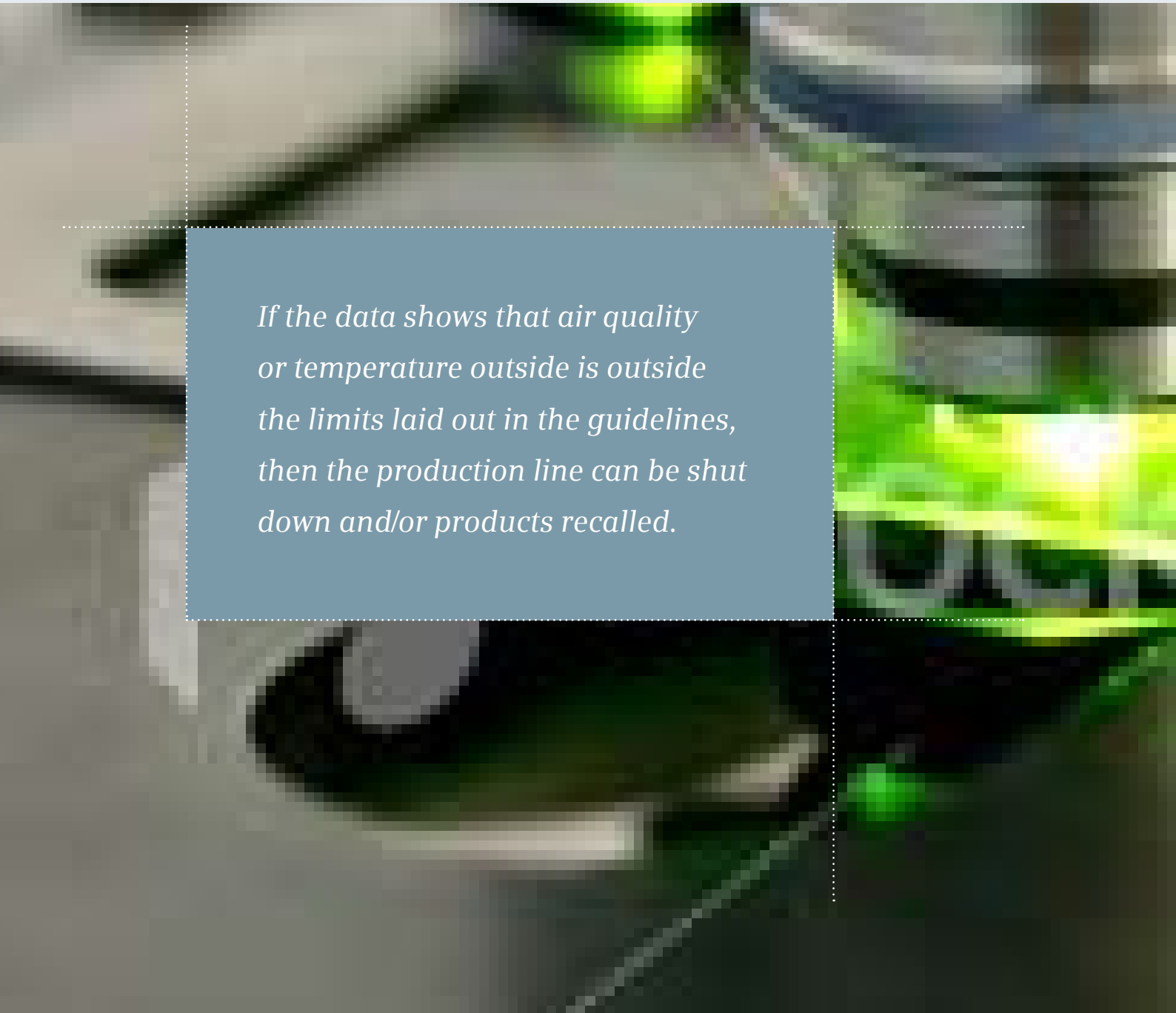
The TGA (Therapeutic Goods Administration) is a guarantor of public confidence and this is key to the ongoing success of the pharmaceutical industry.

The role of the TGA is to ensure the quality, safety and efficacy of medicines. In carrying this out, the reach of the TGA is broad and extends beyond the compounds and efficacy of pharmaceuticals, to regulating and auditing the production conditions. The internal production environment of 'clean rooms' must be strictly controlled, both in terms of air quality and temperature.

Data from clean rooms is audited by the TGA against standards laid out in ISO 14644, with allowable limits varying depending on the grade of pharmaceuticals being produced. The ready availability of data is crucial for firms to prove that their processes meet these criteria. If the data shows that the air quality or temperature is outside the limits laid out in the guidelines, then the production line can be shut down and/or products recalled. The importance of being able to provide consistent, verifiable data during a TGA audit is paramount.

Monitoring a clean room, however, is labour-intensive and expensive. So, how do manufacturers ensure that they are meeting standards while controlling costs in order to remain competitive in the international marketplace?

Many companies are moving towards modular clean rooms and automated control systems that both control and collect data on internal conditions. The value of this is found in both labour cost savings and the ready availability of data to comply with the requests for information from the TGA.



If the data shows that air quality or temperature outside is outside the limits laid out in the guidelines, then the production line can be shut down and/or products recalled.

Maintaining a critical pharmaceutical production environment

Exacting environment standards are required for pharmaceutical production. For example, if drugs are produced at a temperature that does not meet Therapeutic Goods Administration (TGA) Guidelines, the production line must be stopped and all goods produced must be destroyed. The TGA also requires that accurate records and reporting of validated data are available at all times.

GlaxoSmithKline (GSK) Australia had an environmental control system with labour-intensive monitoring and maintenance requirements. GSK needed a more reliable and accurate way to measure and record temperature and humidity readings to ensure the manufacturing facility remained compliant with strict TGA regulations.

GSK needed a more reliable and accurate way to record temperature readings, store records, and ensure that the temperature in the manufacturing facility remained constant.

Siemens developed and installed a building management system for GSK's entire manufacturing site in Boronia, Victoria. The system was installed over an 18-month period without interrupting the manufacturing process.

The building management system constantly monitors, measures and validates the air temperature throughout the facility, and automatically makes adjustments as needed.

Validation of data is a critical issue in the pharmaceutical industry. The automated validation process in the Siemens system ensures that GSK is always ready for unannounced audits by the TGA.

Siemens Building Technologies Account Manager, Greg Young, spoke about the benefits of the new system.

"The automated validation process saves around 60 person hours per month in costs of retrieval, compilation and validation of critical data. This means GSK will achieve a full project return on investment within four years," he said.

Water solutions that save lives

Years of drought and water scarcity have made most of us increasingly conscious of how precious our water supply is. However, we generally take for granted the fact that by simply turning on a tap we can access clean, sanitary water.

Sadly, this is not a reality for all of 6.5 billion people with whom we share the planet. The single biggest cause of illness in the world today is lack of safe water and adequate sanitation. Every year two million people, most of them children, die from water-borne diseases like diarrhoea, cholera, dysentery and typhoid. Whether from drought, lack of infrastructure or natural disaster, water scarcity forces people to drink and wash in unsafe water leading to water-borne illnesses.

In 2000, as part of the Millennium Development Goals, the 191 member states of the UN set a target to "reduce by half the proportion of people without access to safe drinking water by 2015". We are now three years into the UN declared 'Water for Life' decade which ends in 2015.

Dramatically increasing access to safe water and sanitation will not only save lives, it will help reduce poverty by decreasing the cost of treating water-borne illnesses, increasing the number of hours worked each year by reducing the hours lost to illness, and freeing girls and women (generally the primary water collectors in underdeveloped countries) to attend school and undertake productive work. The UN estimates that one dollar invested in water supply and sanitation can provide an economic return of up to 34 times, depending on the region of investment.

It's easy to think about such a large scale global problem and feel overwhelmed and unable to make a difference. Fortunately, there are simple, concrete solutions already being employed.

Siemens technology offers businesses and local governments affordable and reliable water purification and sewerage treatment systems. To make these systems available in remote and underdeveloped regions, Siemens teamed up with the Sky Juice Foundation, a non-profit organisation based in Australia that facilitates access to clean drinking water in developing countries and crisis zones around the world.

The collaboration resulted in the development of the SkyHydrant Potable Water system. The

SkyHydrant incorporates Siemens low-pressure membrane technology. It can produce a miminim 10,000 litres of potable water each day, and is easy to transport, install and operate. Over 350 of these systems have been installed in 16 countries, .

In 2007 Siemens Australia, the SkyJuice Foundation, the International River Foundation, and the Tweed Shire Council Employees Scheme collaborated to establish the Safe Water Kiosk in the village of Obambo-Kadenge in Kenya. The Safe Water Kiosk consists of four SkyHydrant units, a pump powered by a small windmill, a water container, a storage tank for clean water, and a tap. It can produce 2,200 litres of potable water per hour.

"This project demonstrates that world best potable water technology is affordable for even the poorest communities and can save lives and enhance the human spirit," said Rhett

Butler, Chairman of the SkyJuice Foundation and Siemens Industrial Automation & Control Water Technologies Business Development Manager.

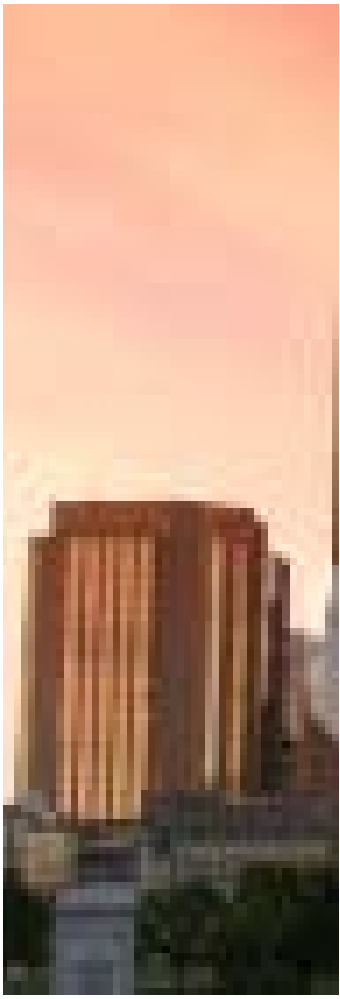
Before the Safe Water Kiosk was installed, residents had to rely on contaminated water from a local reservoir. Diseases such as cholera, typhoid fever and dysentery were a common occurrence. Hopefully, these illnesses will become only a distant memory.

The project received international recognition when it won the 2007 Siemens Corporate Responsibility Award ahead of 181 teams from around the world. Staff from the Tweed Shire Council are already planning another safe water project for rural Kenya which they hope to have completed by the end of the year.

To learn more about the innovative solutions available and how you can help, visit the SkyJuice Foundation website www.skyjuice.com.au.

Security in focus

The effects of climate on security have been the focus of discussion and debate.



A recent survey conducted by The US Studies Centre showed that 40 per cent of Australians believe that climate change is a greater threat to security than terrorism. This reflects the sentiment of Mick Keelty, Australian Federal Police commissioner, who said that "climate change is going to be the security issue of the 21st century."

During a UN debate, British Foreign Secretary, Margaret Beckett, who chaired the Security Council's first debate on global warming said, "This is an issue which threatens the peace and security of the whole planet."

Mrs Beckett said recent scientific evidence confirmed the worst fears about climate change. She warned of migration on an "unprecedented scale" because of flooding, disease and famine.

"Climate change is a security issue but it is not a matter of narrow national security – it has a new dimension," she said. "This is about our collective security in a fragile and increasingly interdependent world," she said.

In National Security and the Threat of Climate Change, retired US military leaders studied the potential long-term effects of climate change on security. Their report states:

"Unlike most conventional security threats that involve a single entity acting in specific ways and points in time, climate change has the potential to result in multiple chronic conditions, occurring globally within the same time frame."

"Economic and environmental conditions in already fragile areas will further erode as food production declines, diseases increase, clean water becomes increasingly scarce, and large populations move in search of resources. Weakened and failing governments, with an already thin margin for survival, foster the conditions for internal conflicts, extremism, and movement toward increased authoritarianism and radical ideologies."

Transforming Melbourne's CBD

The trend toward urbanisation has been evident in Australia for nearly 150 years. In 1861, less than 40 per cent of people lived in towns. It is now estimated that 75 per cent of Australians live in capital cities and other urban areas. Increasing urbanisation creates challenges in providing safe and liveable cities. Melbourne's CBD is an example of how growing cities can provide people-friendly environments.

Through a combination of vision and insightful and detailed planning, Melbourne's CBD has been transformed over the past two decades into a vibrant commercial, retail, arts, entertainment and educational hub.

Despite its valiant attempts to create inner-city space with projects like the City Square and the Bourke Street Mall, the City of Melbourne had long struggled to invigorate the city. Danish architect and Professor of Urban Design at the School of Architecture at Royal Danish Academy of Fine Arts in Copenhagen, Jan Gehl, was commissioned to undertake a study of how Melbourne's CBD (central business district) could be improved.

Gehl's 1993 report, titled *Places for People*, set the benchmark against which future improvements in the city could be measured Gehl's philosophy is simple: if you are willing to give people the space to move about and reduce car access you immediately create a different atmosphere.

Transport priorities were reassessed, with public transport, cyclists and pedestrians being the big winners. On-street parking has largely been eliminated and a tax imposed on all parking spaces within the CBD.

Swanston Street was closed to traffic, allowing access only to service vehicles, taxis, tourist buses, cyclists and trams between 7am to 7pm. A separated bike lane was built along the northern part of Swanston Street that links the universities with the CBD.

The east side of Flinders Street station was upgraded to complement the redeveloped tram stop opposite and work is continuing along Melbourne's busiest streets to upgrade tram stops to encourage more people to commute.

Robert Adams, Director, Design and Urban

Environment, City of Melbourne says that it is Melbourne's laneways and arcades, built to connect the CBD's major streets that have influenced city life. Closing streets to traffic and extending pavements has encouraged the number of outdoor cafes and small, interesting businesses to flourish, creating a village atmosphere.

The amount of public space on streets and in squares increased 71 per cent between 1994 and 2004 and the number of outdoor cafes increased from two in 1983 to more than 350 by 2004.

The footpath in Swanston Street was widened by 3.5 metres and more than 100 trees were planted between Flinders and Bourke Streets. Pedestrian traffic in the Bourke Street Mall nearly doubled in the decade to 2004, with a similar increase in the volume of night-time pedestrian traffic.

Since 1983, there has been an 830 per cent increase in the number of people living in the city, including a 62 per cent increase in the number of students, contributing to Melbourne's more vibrant feel.

Considerable attention has been given as to how to make the CBD safer. In addition to the more than 45 CCTV cameras installed around the city, and plans to more than double this number, passive surveillance has been achieved by the placement of street furniture, outdoor cafes and other features such as a permanent flower stall outside the Melbourne Town Hall and street vendors.

It is not just the larger planning changes that have transformed the city. Finer details, such as the cultural activities, the outdoor areas, cafes and the little discoveries like street art, street chess, music and street theatre, provide a more creative and liveable feeling to the space.

Melbourne's transformation was cemented with the opening of Federation Square and the riverfront development. While not popular initially, Federation Square became the preferred outdoor meeting and entertainment space during the 2006 Commonwealth Games. Walking paths now connect Federation Square with the Tennis Centre and Melbourne Cricket Ground to the east, and the Melbourne Exhibition and Convention Centre and Crown Casino to the west.

Integrated security at Federation Square

Since opening in 2002, Melbourne's Federation Square has become the city's cultural and community hub. The square has had 37 million visits since opening and hosts 1,500 events each year.

Since opening in 2002, Melbourne's Federation Square has become the city's cultural and community hub. The square has had 43 million visits since opening and hosts close to 200 events each year.

The innovative architecture created challenges in designing a security system for the site.

Mark Bullen, Federation Square's Manager of Operations, said, "It's a very complex site with a lot of areas and space to cover. We needed to ensure that we could cover all the areas adequately."

Siemens won the tender for security and building controls for the project in 1999 and played a vital role in the success of the project. Siemens' participation included:

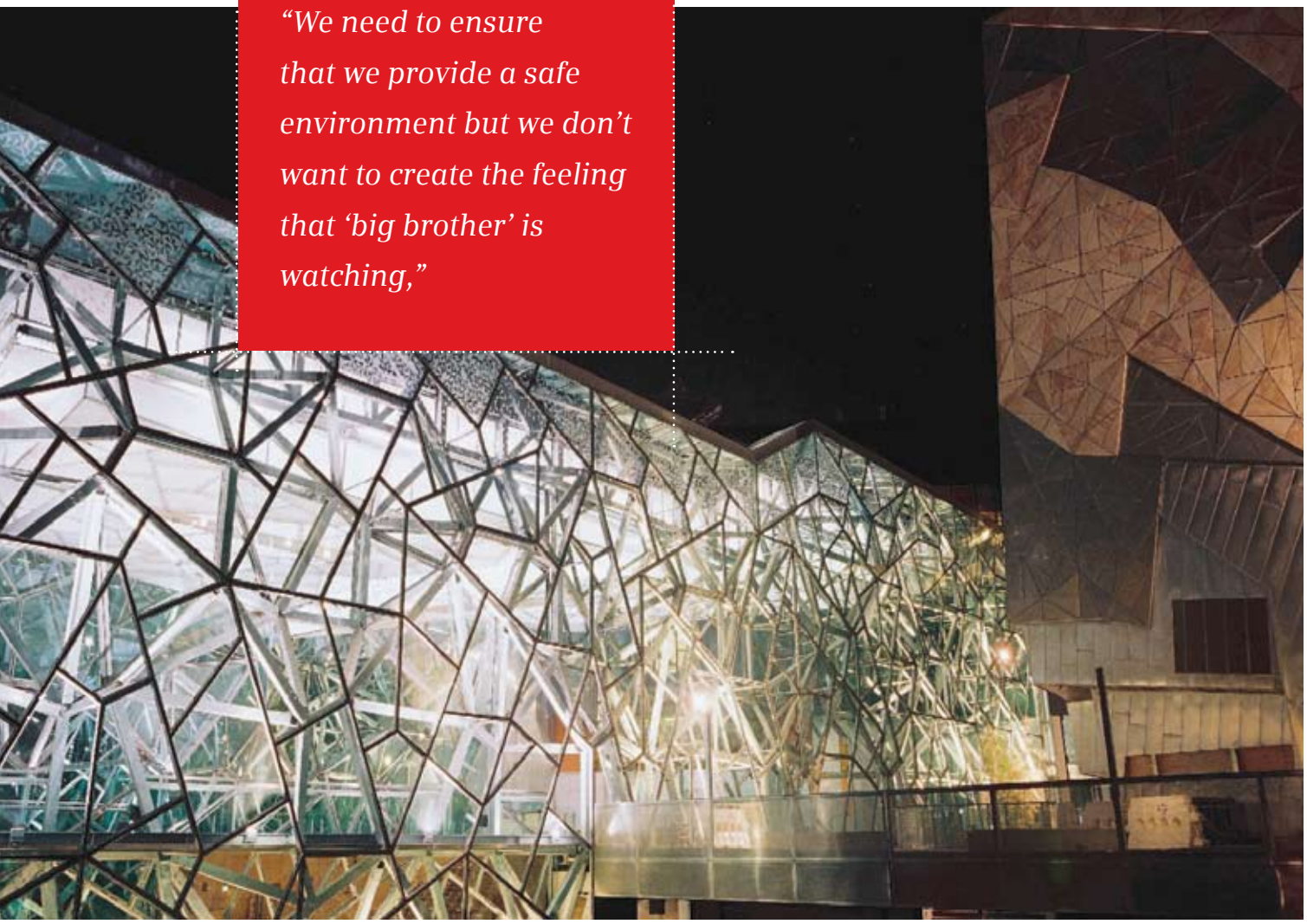
- project management supported by specialist technicians and installers
- installation, fitting and commissioning all access control points, cameras, recording systems, temperature and humidity sensors and controls
- installation and commissioning of the main computer servers for each of the systems
- handover of each completed system to the builder.

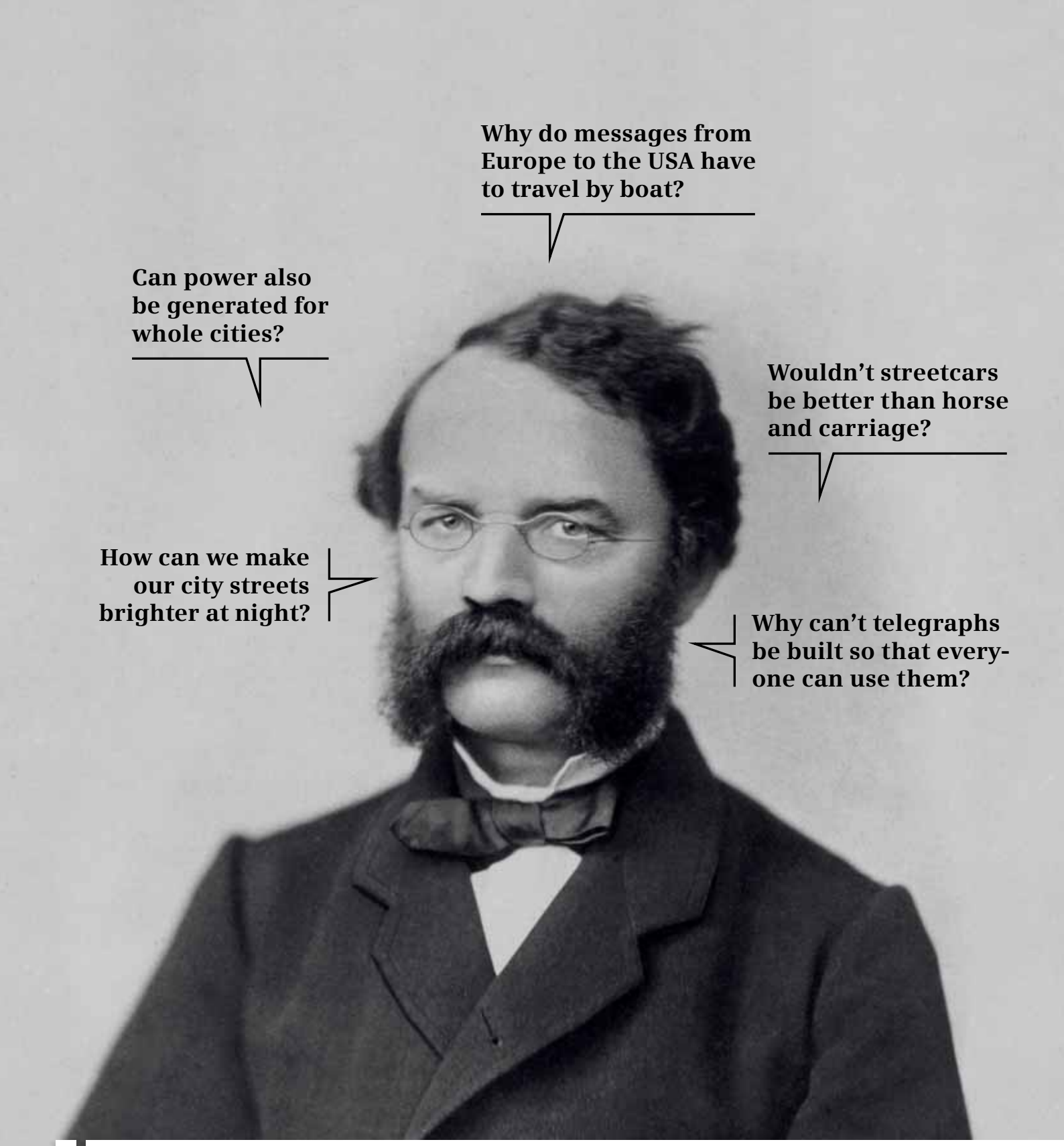
The access control system restricts entry to non-public areas without the need for security guards at all doors. The CCTV system provides instantaneous views to monitors in a manned control room and enables security officers to see what is happening around the site before despatching foot patrols. The network of 200 cameras is linked to digital recorders which store footage for up to 30 days.

"We need to ensure that we provide a safe environment but we don't want to create the feeling that 'big brother' is watching," Mr Bullen said.

"The architecture is very important at Federation Square. The systems need to fit in with the architecture and not be intrusive. Siemens has delivered this through a very intricate CCTV system. As a result, we are able to closely monitor all areas to ensure a safe environment for all people who come here," he said.

"We need to ensure that we provide a safe environment but we don't want to create the feeling that 'big brother' is watching,"





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