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Australia's New Energy Paradigm

Investments into Australia's power sector enable the industry to meet the collective goal of becoming a cleaner, greener nation

For years, Australia has been heavily reliant on plentiful domestic coal resources for electricity generation, but recent federal legislations are explicitly designed to restructure the country's power supply. The July 1, 2012 introduction of the Labour government's much-debated carbon tax has signaled a new wave of enthusiasm for renewable energy projects that have previously been considered a complement to Australia's coal-fired generation matrix. In another move to promote renewables, the federal government has instituted a Renewable Energy Target of 20% renewable power generation by 2020, representing a 10% increase from current levels.

These developments have taken place at a time when Australia has successfully navigated the harsh waters of the global financial crisis, thanks in large part to its energy-intensive resource industries. Australia's GDP growth during the first half of 2012 ranked amongst the developed world's highest rates at 3.7%. In another stamp of approval for Australia's economic success, the International Monetary Fund predicted that Australia would outperform all advanced economies for at least the next two years.

The continued growth of Australia's economy is largely contingent upon the availability of cheap, reliable power, which currently equates to coal and gas. While publicly there is excitement surrounding the development of renewables, industry proponents themselves acknowledge that wind, solar and biomass are in the early stages of commercialization. For now, coal remains king.

Coal-fired power stations have been the reason for Australia's successful economic growth in every state, according to Peter Jackson, managing director of Eraring Energy, a state-owned utility in New South Wales that operates the 2880 MW Eraring coal-fired power station. "Consumers are increasingly aware of electricity pricing, having increased substantially over the last few years. This price increase is due to distribution costs, while generation costs are exactly the same today as it was five years ago – in real terms, costs have reduced due to increased efficiencies in coal-fired power stations," he said.

Condenser Cooling Water Piping. Photo courtesy of Eraring Energy.

The company recently invested A$600 million into Eraring power station for environmental upgrades and increasing capacity.

David Pryke, executive vice-president, Energy at Siemens Australia, estimates it is unlikely there will be a new fossil plant in coming years, which he attributes to a fall in demand. "There has been a lower energy demand in the manufacturing industry because of closures apportioned to the high value of the Australian dollar. The public has become cost-conscious and more frugal with electricity use," he said.

Household electricity bills have risen almost 50% over the past three years. The Australian Energy Market Operator, who over-

PowerSense's DISCOS® overhead combined (current and voltage) sensors for medium voltage. Photo courtesy of PowerSense.

sees the retail market, overestimated peak demand in every Australian state and was forced to revise its projections. These original estimates caused utilities to funnel capital expenditures into the upgrading of the electricity networks, which led to higher prices as they seek to recoup their investments.

TransGrid, the state-owned transmission company in New South Wales, implemented a number of projects designed to upgrade the network capability, despite ongoing political debate about so-called "gold plating," where continued investment into networks has been questioned as excessive. "Gold plating is a term that has unfortunately taken off in the political domain for the purpose of media attention," said Peter McIntyre, TransGrid's managing director. "As one of the Southern Hemisphere's biggest economic hubs, Sydney needs a reliable network. Transmission failures, while considerably rare, can have catastrophic consequences. When systems deteriorate to the point of failing consistently, the time to recover can be measured in years. Our job is to meet customer's reliability expectations at minimal capital expense. TransGrid aims to spend its available funds wisely and prudently by identifying the latest possible point we can invest in augmenting the network. Our Board has deferred almost A$1 billion of projects in the last 12 months. However, much of our grid was built in the 1960s and 1970s, and networks on average have about 50-year lifespans. It is appropriate that we have an ongoing program to replace it."

In 2013, the company instituted a price freeze for the year, in response to the rising

Peter Jackson, Managing Director, Eraring Energy

electricity costs. "TransGrid is sensitive to the debate around rising power prices and wants to be part of the solution. We are very conscious that our revenues fluctuate, although for good reasons. As you build more capital, greater funds are required; and the cost of capital also varies. However, these fluctuations are not good news for end users, who receive them as power prices. These prices have risen in recent years due to a combination of factors: networks' liability standards, ageing infrastructure, ris-


Peter McIntyre, Managing Director, Transgrid


Andrew Halliday, Sales and Support Manager, ANZ, PowerSense

ing capital costs in international markets, increasing gas prices and the introduction of a carbon price scheme. Our solution is to freeze our prices in 2013 and then smooth them over the following years," said Peter McIntyre.

One way that utilities can combat the rising costs of electricity passed along to the consumer is through the use of smart grid technologies. Energy management technologies have applications in both the high- and lower-ends of the energy market in Australia, said Andrew Halliday, sales and support manager of Australia and New Zealand of PowerSense, a Denmark-based smart grid company who have targeted Australia as a growth region. "Smart grid is moving forward on two fronts: high-end functionality where sophisticated technology is required to measure power quality; and an increased focus on low-end technologies, such as transformer loads," he said. PowerSense's Australian operations currently contribute 40% of the company's global revenues.

The Australian government is employing a number of state-based programs to advance the deployment of energy management systems. The state of Victoria, in southern Australia, mandated that smart meters be installed in all Victorian households and small businesses by the end of 2013.

Despite the Victorian government's support of a smart grid rollout, some companies still feel that the industry needs better regulation in this area nationally. Oliver Iltisberger, executive vice-president, Asia Pacific at Landis + Gyr, an international smart metering company, explained: "The industry needs a clear regulatory framework for the rollout of smart metering or smart grid technology in the other Australian states. Until this regulatory framework is in place, it will be difficult to secure investment to move smart grid projects forward."

A clear regulatory framework is also essential because, according to Michael Cummings, fund manager of the Infrastructure Fund at AMP Capital, Australia as a country is combating low productivity gains. "Arguably, investment in technology such as smart meters will help drive productivity," he said.

According to Michael Rath, National Leader of Energy and Water at Deloitte, the customer will be one of the biggest catalysts for driving change in the power sector: "The industry is going through a tremendous amount of change. Nowhere is this more apparent than in the technology area: we are moving to a digital-based industry. This will impact the way networks are designed and how customers interact with their energy providers."

For the foreseeable future, demand management technologies and infrastructure upgrades are the answer to the question of how to provide energy for Australia's still-growing economy. "There should be no additional baseload requirement before 2020, as energy consumption has fallen largely as a result of the slowing in GDP growth, a reduction in demand from the manufacturing sector, noticeable price elasticity in the residential sector, and the success of federal and state energy efficiency schemes," explained Gilles Walgenwitz, general manager of government and utilities at Energetics, an energy management consultancy with offices across Australia.

The country is entering a new phase of energy management: one that focuses on the effective delivery of energy to its population rather than continuous supply, and it is up to regulators and industry alike to ensure a smooth transition.