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Energy Industry Urged to Consider New Leadership Role

Energy industry engineers and senior managers have been told to re-examine their role within the electricity sector, and show some leadership in driving the changes needed for New Zealand's immediate and future energy needs.

Speaking at an industry workshop in Christchurch, long-serving industry supplier Brian Tolley said industry participants needed to take a more active stance.

Mr Tolley, the former managing director of Tolley Industries Ltd, says there is total frustration within the industry about the way the physical and performance issues are being left out the debate about New Zealand's energy future.

"Electricity is the oxygen of the whole digital age and yet we have an energy sector with holes big enough to drive a bus through," says Mr Tolley. "The pioneers of the New Zealand energy sector did a fantastic job, but now we have a system that is old, constrained, overvalued, with no checks and balances on its efficiency, no research and development occurring, and basic problems such as customer meters that are 50 years old.

"There are many people in the industry saying we can longer wait for the Government or the regulatory interventions to take the lead – and that it's time for the industry participants to step up and show some leadership."

Dr George Hooper, executive director of the Centre of Advanced Engineering, says the workshop revealed a growing understanding of the potential for Distributed Generation (DG), demand-side management and system optimisation to improve the efficiency and security of the network.

Presenters from Australia and the United Kingdom were able to highlight the significant advances in this technology over the past five years, and how far New Zealand has fallen behind in the modernisation of its energy systems.

"All of these strategies are well known, but

Energy21 is published bi-monthly by the Centre for Advanced Engineering, Christchurch, New Zealand

there is still very little progress. With a regulated environment and an administered market the status quo prevails. The industry has the solutions, and this event has shown how much is possible."

About Distributed Generation

DG can be defined as smaller-scale generation which is not connected to the national grid. Examples of DG in New Zealand include the co-generation plant at the Kinleith pull mill and the new power plant at Auckland Hospital. These supplementary supplies may be for a specific user, such as a manufacturer, or they could contribute to local demand. A major advantage of DG is that it can avoid the need for big investments in the distribution network, such as the proposed upgrade of New Zealand's ageing transmission lines. It also allows for a diversification in the use of primary fuels (coal,

gas, diesel, oil etc), which in turn allows major users to manage their energy supplies and costs by "fuel-switching."

About CAE

The Centre for Advanced Engineering (CAE) is a Christchurch-based charitable trust and independent think-tank. Its mission is to advance social progress and economic growth for New Zealand through emerging technologies and advanced technology solutions.

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General News

System Losses

The UK Regulator Ofgem has recently done extensive work on the subject of system losses with a view to building incentives into pricing structures that encourage the reduction of losses. Most of their work is in the public domain and published freely. Visit to the website www.ofgem.gov.uk

Security of Supply

The UK DTI/OFGEM Distributed Generation Coordinating Group (DGCG) have released a report *Developing the P2/6 Methodology* which assesses the security of supply capability of UK distributed generation. Meanwhile a report has been produced for the European Union's Director General Energy and Transport, *A Green Paper Towards a European Strategy for the Security of Energy Supply*.

CHP

The University of Massachusetts and Pace University have just launched (and recieved funding for) the Northeast CHP (combined heat and power) application centre (www.northeastchp.org/nac/home.html) to assist companies investigate onsite generation with heat recovery.

Environmental Action Plan

UK Energy regulator Ofgem has published its Environmental Action Plan annual review. The review details Ofgem's progress during the last

year on environmental issues, and sets out the ways it intends to meet its environmental responsibilities for the year ahead.

According to Ofgem its key achievements from 2003 to 2004 include proposals to encourage distribution companies to connect renewable generators as part of the next distribution price control. The regulator also claims to have promoted additional investment in the Scottish transmission system to allow more renewable generation connections.

Ofgem also says it has issued more than seven million Renewables Obligation Certificates, and approved 120 schemes under the Energy Efficiency Commitment leading to energy savings of 47TWh. Key priorities for the coming year include finalising the new incentive framework for distributed generation as part of the 2005 distribution price control as well as to provide initiatives to improve customer awareness of the environmental consequences of their energy use.

Shared Cogeneration

A new industrial precinct planned for the Victorian regional centre of Bendigo will use waste heat from on-site energy generation to power its industrial processes. The Bendigo Food Manufacturing Precinct will be a first for the use of co-generation in shared infrastructure in Victoria. A conglomeration of local food manufacturers will share the costs and reap the benefits of shared energy generation and use of waste heat, waste collection, bulk buying power



and on-site water collection and treatment. Capital investment in the co-generation facility is likely to be about \$2.5 million with a \$50,000 grant from the Victorian Government.

Paid to Switch Off

Businesses may be paid to switch off or reduce their power use during peak times under a scheme being advocated by the Energy Users Association of Australia. Executive director Roman Domanski would like to create a simple mechanism for electricity suppliers to effectively buy back energy from the user. He said the scheme just needs a push from government and regulators. As discussions are underway with the Demand Management Task Force in NSW and the Ministerial Council on Energy at a federal level, Domanski believes a scheme could be in place by summer. He estimates businesses could be paid around \$1/kWh for their unused peak electricity.

Demand Side Management

The International Energy Agency (IEA) Demand Side Management Programme and The Energy Supply Association of Australia (esaa) jointly announced the launch of two major multi-national DSM projects.

The first project entitled Demand Response Resources (DRR), involves the international collaboration of ten countries, which in addition to Australia include: Norway, Sweden, Finland, Denmark, Spain, Italy, Japan, Korea and the USA. The DRR Project will provide the technology, economic and implementation tools needed to rapidly implement electricity demand response to address growing electricity peak demand issues which can create reliability and price volatility issues in the participating countries.

The second project, Network DSM, also involves an international collaboration, including participation by Australia, France, Spain and the USA, plus possibly other European countries. This project focuses specifically on problems in electricity networks. This project covers a broad range of DSM measures, including energy efficiency, interruptibility, fuel switching and distributed generation, which can be directed to relieving network constraints. These constraints may be time-related (e.g. loads at times of the network system peak) or location-related (e.g. loads on particular circuits or substations). The Network DSM project will concentrate on identifying the most appropriate DSM measures to overcome the types of network problems which have been linked to the blackouts seen last year in the USA and Europe.

Hans Nilsson Chairman of the IEA Demand Side Management Programme says, "Customer demand response is absolutely essential to address the growing issues affecting our electricity distribution systems around the world. This international collaboration process allows us to deliver the tools to rapidly implement demand

response on a more cost effective basis than if each nation were to attempt this alone."

"The Australian electricity market faces many of the same problems as the USA, Asia and Europe in heavily congested distribution systems threatening the security of our grid," says Harry Schaap, General Manager, Environmental and Sustainable Energy of the Energy Supply Association of Australia. "We are pleased that Australia is taking a lead role in identifying and refining solutions to these problems."

Ross Malme, Operating Agent for the DRR Project and CEO of RETX in the USA indicates, "Our June 7th Workshop in Melbourne with the key stakeholders in the Australian Electricity Market demonstrates the commitment Australia has to demand response. We expect these two projects will have a major impact on improving electricity reliability and reducing electricity costs to each and every country participating in the projects."

"Many countries around the world are facing massive expenditure in upgrading their electricity networks to cope with increasing load," says David Crossley, Operating Agent for the Network DSM Project and Managing Director of Energy Futures Australia Pty Ltd. "Using DSM measures to help relieve network constraints can reduce the need for some of this expenditure and also achieve beneficial environmental outcomes. The international collaboration will enable each of the participating countries to learn about DSM measures and techniques which have proven to be successful in other countries."

Micro Generation

A UK Engineering recommendation now exists in order to simplify connection. It has been prepared jointly between the UK Distribution Network Operators (Wires) and the Micro Generator community. It covers all generation with outputs up to 16A/phase (3-10kW). Any micro generator which meets this recommendation can connect in parallel with the UK network without any prior approval of the Network Operators. All that has to be done is to inform them at the time you switch it on.

Contact Energy's Information Campaign

To read the contents of the booklet to assist the debate on electricity supply and demand "A Question of Balance", see www.positive-energy.co.nz

MARIA

The MARIA annual review for the period 1 April 2003 to 31 March 2004 is now available. The review provides an overview of the work undertaken by MARIA over the past year, including preparing for the transition to the Electricity Commission and progressing the MARIA workplan. It also summarises the rule

changes completed during the year, the work of the project teams and working groups, and governance and compliance activities. This year, the review has only been produced in an electronic version. The pdf is available at www.nzelectricity.co.nz/c3maria/MARIA_Annual_Review.pdf

Ofgem fines Powergen

UK Energy regulator Ofgem signalled its intent to impose financial penalties totalling £700,000 on Powergen after the company unfairly stopped more than 20,000 domestic customers from switching to new gas or electricity suppliers.

This decision follows an investigation by Ofgem's enforcement team which covered the period between October 2002 and July 2003. Customers affected included those who pay by direct debit, through regular cash payments or with prepayment meters.

Ofgem Chairman, Sir John Mogg, said: "This was a clear breach of the special rules relating to customers in debt. These customers entered into agreements under which they were making regular payments for their energy supplies. They were then unfairly stopped from switching to a new supplier.

"While Powergen co-operated fully in the investigation, Ofgem still finds this to be unacceptable behaviour which is why we have proposed a financial penalty. Three energy companies have already received financial

penalties for similar reasons and we warned other firms at the time that we would not tolerate similar behaviour. We are serious about clamping down on any actions which damage customer confidence when switching suppliers."

Powergen has since confirmed that it has now reviewed and revised its procedures and believes it complies fully with arrangements concerning customers in debt.

Nano Technology

Not only is present technology exhausting its resource base while polluting the environment, it is also ludicrously inefficient and almost gratuitously dirty. No law of nature demands that things must be done this way, states Stephen Gillett in Nanotechnology for Clean Energy and Resources. The solution is nanotechnology, according to Gillett. "It offers the only prospect of providing something like a sustainable First World standard of living for the entire world. This is the most critical near-term application of nanotechnology." Nanotechnology is the study and manipulation of objects that are measured in nanometers (nm). One nanometer is a billionth of a meter, or a millionth of a millimeter.

"By manipulating atoms at this level we can emulate biological processes, creating a sea change in how we create energy and products. Imagine, for example, molecule-sized solar cells mixed into road pavement. A few hundred square miles of solar nanocells in sunny pavement could generate enough energy for the entire country."

Activity Notices

UK's Ofgem has published the following documents recently:

121/04: Notice under Section 11A (2) & (3) of the Electricity Act 1989 - proposed modifications to distribution standard licence conditions 4-4C (electronic format only)

135/04: Property Arrangement Schemes: Guidance on Procedures (electronic format only)

136/04: The provision of metering services by new electricity distribution networks - decision document (electronic format only)

137/04: Legal arrangements for the transition to and implementation of the British Trading and Transmission Arrangements. Ofgem/DTI statement of approach (electronic format only)

154/04: Open Letter - Licence conditions in electricity generation, transmission, distribution and supply licences relating to the Fuel Security Code in England and Wales and directions issued under sections 34 and 35 of the Electricity Act 1989 - Ofgem/DTI revised proposals under BETTA (electronic

format only)

155/04: Open Letter - Legal arrangements associated with the transition to and implementation of BETTA that will affect holders of electricity generation, distribution and supply licences (electronic format only)

The project to revise Engineering Recommendation (ER) P2/5 to recognise the security contribution of distributed generation has reached a further milestone. A report by UMIST to Workstream 3 of the DGCCG's Technical Steering Group has been published and is now available at www.distributed-generation.org.uk

Also, NGT has published a summary of the responses to its consultation on Options for Allocating GB Transmission Access Rights Under BETTA. It is now available on National Grid Company, Industry Information website http://www.nationalgridinfo.co.uk/betta/betta_cons.html

To access Ofgem documents, go to <http://www.ofgem.gov.uk>

Published Articles

Keep doors open on hydro power says IPENZ

New Zealand can't keep closing the door on renewable energy options such as hydro power, said John Gardiner, the Institution of Professional Engineers New Zealand (IPENZ) Deputy Chief Executive.

Mr Gardiner said this in response to the Environment Court's recent decision to reduce the water rights that underpin the Tongariro Hydro Power Scheme, and similar instances where obtaining water allocations and consents are becoming difficult.

"Every time the Resource Management Act makes it difficult for hydro schemes to become established, New Zealanders are left with fewer desirable alternatives for their energy future. If we don't fill our energy needs from renewable sources we become reliant on non-renewables, particularly carbon based fuels," he said.

"In the case of the Tongariro Power Scheme the Environment Court's decision to cut the water rights from 35 years to just 10 years sent a clear message to power companies that it is too difficult to develop hydro generation in New Zealand.

"Although this may favour some interests it is bad for New Zealand as hydro generation has an important role as our energy needs continue to grow," said Mr Gardiner.

"We in New Zealand are lucky that we have a high proportion of renewable energy through our hydro capacity both existing and potential, and we shouldn't completely stop exploring those options – although it is unlikely that hydro power will make such a large contribution to our future energy mix.

"Wind energy is often cited as the world's fastest growing energy source – and although wind energy does provide a clean, renewable energy option, it cannot replace all other forms of generation because the wind cannot be relied upon to blow at the right time.

"Research suggests there is a synergy between hydro and wind generation, because on a still day when you can't turn on your lights, you can turn hydro power up to its full capacity almost instantaneously," he said.

New Zealanders favour renewable energy growth

An EECA study just released shows that New Zealanders overwhelmingly support wind energy and hydro electricity.

Wind power comes out top in the EECA commissioned survey, conducted by UMR research, of attitudes towards electricity generation options. Some 82 per cent of

respondents approved or strongly approved of wind power. Hydro generation was the next most preferred option with 79 per cent approval while geothermal scored 67 per cent.

"Not only does this report show very strong support for wind developments overall, it indicates low levels of the 'not in my back yard' or NIMBY syndrome. When people were asked if they support a wind farm being built in their local area, support dropped to only 60 percent with only 18 per cent opposed.

Only nine per cent did not want them even if they could not see or hear them," said Energy Minister and Convenor, Ministerial Group on Climate Change, Pete Hodgson said.

Wind power is already set to grow four fold from around 40 MW to 160 MW in the year to next April. This growth is in part due to the government's Projects to Reduce Emissions programme under which six proposed wind farms are being awarded carbon credits.

The programme awards credits to projects that reduce greenhouse gas emissions that would not otherwise go ahead. A further six million credits were made available for a second round, to be run later this year, as part of Budget 2004.

"New Zealand has an abundant wind resource capable of producing about 20 per cent of New Zealand's electricity needs. The perceived main problem with wind, that it is unreliable, is not an issue in New Zealand. Wind and hydro are ideal complementary renewable power sources because when the wind does not blow, we effectively have electricity stored in our hydro lakes. This resource, coupled with high levels of public support for wind and renewable energy; plus government initiatives, will encourage many more developers to bring forward new plans," said Pete Hodgson.

Distributed Generation Gives Utilities Reason to Consider Net Metering

When a utility customer decides to take the necessary steps to install a small private power generator at his or her home, it creates a bit of a quandary for utilities, and the customer alike.

US Federal law says that customers who make the investment to install a private hydro project, solar generation, a wind turbine, or even a fuel cell to generate all of the power the home needs obviously don't want to pay a utility bill. Common sense would dictate that most also would not want to be disconnected from the grid, just in case something went awry with their personal system.

At Sacramento Municipal Utility District (SMUD), the utility will buy solar power their customers generate at the full retail rate. Clark Public Utilities (Vancouver, Wash.), and Snohomish County PUD

(Everett, Wash.) buy excess electricity, produced by any environmentally-friendly generation project, also at the full retail rate.

SMUD's program, the SMUD PV Pioneer Program, began in 1993 giving the utility an opportunity to partner with customers who had the ability to assist with the early development and implementation of photovoltaic technology.

The program's first seeds were planted when SMUD started purchasing, installing, owning and operating 2 to 4 kilowatt rooftop solar systems on "borrowed" rooftops of their customers.

The PV Pioneer Program is one of the nation's leaders in net metering. Nearly 600 systems have been installed on the property of SMUD customers who agreed to help Sacramento reach toward more solar energy.

The program has helped SMUD reduce the cost of solar electricity for the future by helping the district learn and gain valuable experience in terms of installing, operating, maintaining, and pricing home photovoltaic systems.

Because of the experience the utility has gained through the PV Pioneer Program, customers can now take part in true net metering by purchasing their own PV systems, and consuming the electricity in their own homes.

In 2001, SMUD customers paid \$4,800 for a typical 2,000 Watt solar system, which would provide roughly 50 percent of an average customer's usage. The district made volume purchases of equipment needed to install a residential system, and bought down nearly half the cost of the system, helping customers to find the capital investment more affordable.

Like most other utilities, when the home-based systems generate more electricity than the customer needs, the excess is purchased by SMUD at retail rates. When customers use more than the solar system provides them, they are given the choice between paying a monthly bill, or to pay an invoice to settle their account at the end of a one-year span.

Snohomish County PUD (Everett, Wash.) has a program that lets those customers who do generate their own environmentally-friendly electricity "store" the electricity that is more than their immediate needs with the PUD for future use.

Those Snohomish PUD customers who use fuel cell, solar, wind or hydroelectric generation in their homes that are capped at 25 kilowatts are eligible for the PUD's Net Metering Program. Those customers who take part in the PUD's program, connect their private generating equipment to the SnoPUD distribution system.

In cases when the customer is producing more power than the household needs, the meter on the customer's home will literally spin backwards, sending power back to the grid. The customer essentially sells their excess electricity back to the

utility in return for credits on their account equal to the current rate charged for power by the utility. Any credits earned by net metering are carried over month-to-month, but do not carry over into a new calendar year.

The PUD requires an inspection of the distributed generation project so to ensure that technical and safety requirements are in place to protect the distribution system. It also will install a more modern electric meter, assuring accurate measurement of the power that the customer provides to the grid.

Grays Harbor PUD's (Aberdeen, Wash.) net metering policy is similar to the one at Snohomish PUD. Grays Harbor approved its formal policy in 2002, as required by Washington state law. At Grays Harbor, at the end of each year, the utility pays customers for private generation over and above what they consume. The utility reimburses customers at half of the retail rate, even though the state allows utilities to require customers to deliver the excess generation without reimbursement.

At Clark Public Utilities, net metering has been in place since the early 1980s, according to Corporate Communication Manager Mick Shutt.

"We have one customer who has a little tiny hydro project and one who has a solar project."

The hydro project, surprisingly, is located in an urban area of Vancouver, fittingly not far from the Columbia River.

Shutt said the Clark program includes systems up to 100 kilowatts, and that the PUD buys excess power at the retail rate.

Federal Law Motivates Net Metering Programs

Federal law (PURPA, Section 210) says electric utility customers can use electricity they generate in their own environmentally-friendly systems to supply the energy needs of their home, allowing them to offset the power they would instead buy from their electric utility. However, the law says that if the customer lives in a state, or is served by a utility where net metering is not allowed, the excess power should be purchased by the utility at the wholesale price.

Net metering makes it easier by letting the customer use any extra electricity to offset utility-provided electricity used elsewhere in the billing cycle. The customer, in exchange, is billed only for the consumed energy provided by the utility.

Seems Like Such a Win-Win

Net metering seems like it could easily be a win-win situation for members of cooperatives and customers of PUDs and municipal systems. But it seems like very few customers are using it.

Part of the reason could be the capital expense of setting up the systems in the first place. Another reason could be that many utilities provide

programs as prescribed by law, but most don't publicize the programs. Instead, they view net metering as more of a headache.

In a time when transmission avenues are congested the same way freeways are, and distribution reliability is such a big issue, perhaps it is wise for utilities to begin taking a more serious look at the issue of net metering.

Utilities gain also because they avoid administrative and accounting costs involved with buying and measuring the small amounts of excess energy provided by private generation systems.

Obviously, customers who are involved in net metering buy less power from the utility, which is an indirect cost for the system.

According to the American Wind Energy Association, the revenue loss is similar to what a utility would experience when a customer reduces electricity use through taking energy efficiency actions.

More Than Half of the States Require Net Metering

Thirty states are currently requiring at least some utilities to provide customers with the opportunity to take part in net metering. The requirements in each state are different.

While most states that allow net metering had the rule enacted by regulatory commissions, California, Montana, Nevada, Oregon, Utah, and Washington all had net metering laws enacted through action of their legislatures in the late 1990s and early 21st Century. Idaho's Public Utility Commission enacted net metering rules in 1980, and the Arizona Corporation Commission enacted them in 1981.

In every case included among the states served by NWPPA member utilities, residential consumers are given the ability to participate in net metering programs, and each state has different regulations.

For example, in all participating Western states except California all customer groups are allowed to be net metering users. California's law says that only residential and small commercial organizations are eligible.

In all cases throughout the NWPPA service territory, except Idaho, the scope of net metering regulations includes all public power and investor owned utilities.

The Future

The horizon shows that there will likely be some sort of increase in the use of net metering as different systems become available to consumers, and prices begin to fall.

With customers learning more and more about the environmentally friendly nature of wind power and photovoltaics - not to mention the coming

emergence of residential fuel cells - they will likely begin learning to use such systems on their own property, and start looking toward their utility for not only some relief on their electricity bills, but also for help and advice with installation.

Net metering makes it easier by letting the customer use any extra electricity to offset utility - provided electricity used elsewhere in the billing cycle. The customer, in exchange, is billed only for the consumed energy provided by the utility.

Nelson P. Holmberg is associate editor at Northwest Public Power Association. He can be reached by telephone at (360) 254-0109, or by e-mail at nelson@nwppa.org. NWPPA. Copyright Northwest Public Power Association Jun 2004.

Can Individual Farmers benefit from Wind Power?

"A recent survey in New Zealand showing that 82 percent of respondents approve of wind power as a solution for our energy needs is good news for future electricity generation in this country" the Convenor of the Sustainable Energy Forum, John Blakeley, said recently. "This contrasts with only 24 percent of respondents who approve of coal-fired electricity generation. The challenge now is to support power developments that meet our desires for a cleaner energy future."

"In order for wind power to now rapidly expand in this country, the Sustainable Energy Forum believes that we have to find a way of connecting wind turbines to our electricity network which will encourage smaller operators to become involved in wind power projects" Mr Blakeley said. "Some form of wind power purchasing agency may be required".

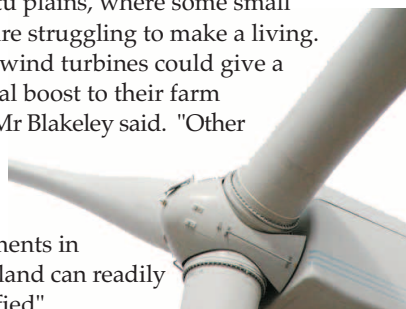
"In some parts of Europe, it is easy for individual farmers to invest in wind turbines on their own farms. The farmers are supported by a simple guaranteed price for all wind generated electricity. This price is not subject to fluctuations in electricity price experienced in a spot market".

"Established power companies want to install bigger wind turbines of individual capacity of 1,500 to 2,000 kilowatts (kW) or more in large wind farms of around 50 turbines. They will tend to be located on ridges and may not be very well tolerated by some people when located near urban areas" Mr Blakeley said.

"On the other hand, dispersed smaller wind turbines of around 500 to 750kW capacity may be an ideal size for places such as the windy Manawatu plains, where some small farmers are struggling to make a living.

Hosting wind turbines could give a substantial boost to their farm income" Mr Blakeley said. "Other suitable areas for such

developments in New Zealand can readily be identified".



"In fact, there may be a number of areas in New Zealand where favourable wind conditions mean that farmers who are struggling financially could significantly boost their income by becoming involved in such projects (as is now the case in Europe), even if only as the 'host' for the wind turbines" Mr Blakeley said.

"As an indication of size, the Brooklyn wind turbine in Wellington is 225kW capacity, the Gebbies Pass (Banks Peninsula) turbine is 500kW capacity and the Tararua Wind Farm turbines (near Ashhurst) are 660kW capacity".

"In the countryside, relatively few people will be affected by the noise or visual impact of these turbines and if built in considerable numbers over quite a wide area, the output from the turbines would be less affected overall by wind fluctuations than a smaller number of large turbines concentrated in a particular wind farm" Mr Blakeley said.

"Smaller wind turbine size will give greater scope for private or community ownership and would be more suited for individual connection (as distributed generation) to local electricity supply networks than are large wind farms, which are more likely to be connected to the national grid".

"Recent amendments to the Resource Management Act to encourage renewable energy should facilitate development of more wind turbine projects, and Regional Plans could do more to encourage local energy initiatives" Mr Blakeley said. "I am very encouraged by the efforts of Wellington City Council in this regard."

"Hydro and wind are ideal complementary renewable power sources because when the wind blows, this will effectively add storage to the hydro lakes. New Zealand has an abundant wind resource capable of producing up to 20 percent of our electricity needs" Mr Blakeley said.

Contact Information

Comments and questions are welcomed!
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Questions & Answers

A place in future issues where you can ask questions or express your viewpoint. If you have a question or opinion, e-mail it to: energy21@caenz.com

Events Calendar

Home Events:

Energy21 Modelling Workshop

Victoria University,
October 19, Wellington

See www.emw.org.nz

RSNZ Annual Conference

Thursday, 18 November, Christchurch

The Royal Society of New Zealand is holding its annual conference at the Hotel Grand Chancellor in Christchurch on Thursday, 18 November.

The theme is energy and will include discussion on how we use it; our usage patterns; and energy sustainability.

The conference will be followed by a one hour reception before Australian energy commentator Mr Alan Pears gives a public talk on "The emerging global and regional imperative: sustainable energy".

Registration details and further information can be found at:

https://www.rsnz.org/secure/events/rsnz_conf2004.php

Overseas Events:

Planning, Designing and Operating the Distribution Network of the Future for the Exploitation of Distributed Energy Resources

Monday 27th to Thursday 30th September 2004,
University of Cagliari, Italy.

All sessions and written material will be in English. Full information (program, instructors, registration) can be obtained by visiting the EES-UETP web page at: www.eesuetp.unibo.it.

World Alliance for Decentralised Energy (WADE) 5th International Conference on Cogeneration and Decentralized Energy

27-28 October, Beijing, China.

For more information, visit the conference website, at www.localpower.org, or the WADE website, at www.localpower.org

Distribution Europe

26-28 April, 2005, Berlin

Distribution Europe is a forum, which identifies, discusses and forecasts developments in the industry. Top-level speakers from key industry segments will present their views using case studies, in-depth sessions and interactive panels.

Registration details and further information can be found at www.synergy-events.com/

QV DATE

