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Newsletter

June 2009

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Sustainability Assessment and Decision Making for Enhanced Well-being: Mauri Tu, Mauri Ora.

ESR Auckland Branch

Date and Time: 7.30 pm, Thursday 18 June 2009

Where: Room 3.407, School of Engineering, University of Auckland,
20 Symonds St, Auckland.

Speaker: Dr Kefa Morgan BE, MBA, PhD, MIPENZ, CPEng, IntPE(NZ). Kefa is a senior lecturer in the Department of Civil & Environmental Engineering, and the Associate Dean Māori for the Faculty of Engineering at the University of Auckland, and Managing Director of Mahi Maioro Professionals. During his twenty plus years of experience in environmental engineering, many as a Chartered Professional Engineer, Kefa has strived to implement sustainable approaches to engineering solutions: this primarily as a result of his Ngāti Pikiao, Te Arawa, Ngāti Kahungunu, Ngai Tahu and Waitaha heritage. Kefa renewed his association with the University of Auckland in 1998 to increase the participation rates of Māori and Pasifika students in engineering. His university roles incorporate teaching and research associated with indigenous engineering and technologies and his research has focused on the creation of an integrated decision making framework for sustainability, the revival of indigenous engineering knowledge, and the development of a new structural building material, UKU, fibre reinforced earth composite.

Abstract: Achieving genuine societal commitment to sustainability is a difficult challenge when society struggles to simultaneously achieve the illusive objectives of sustainability and economic wealth accumulation. Decision making that is dominated by economic imperatives contributes much of this difficulty.

This talk introduces the Mauri Model, a decision making framework that integrates the social, economic, environmental, and cultural well-being dimensions of sustainability referred to in Aotearoa New Zealand legislation such as the Resource Management Act 1991 and the Local Government Act 2002. The Mauri Model is a new decision making framework that adopts mauri ('integrity' or the binding force between the physical and the spiritual elements) as the measure of well-being in place of the monetary basis used conventionally for sustainability assessment. The intention is to encourage the pursuit of enhanced mauri (kaitiakitanga) and holistic well-being instead of the pursuit of enhanced economic wealth.

Web: www.esr.org.nz

Contact: John La Roche, Ph 09 528 9759 johnlaroche@xtra.co.nz
(for more information, No booking required)

Harnessing the Ocean's Energy: New Zealand's Maritime Future

ESR Auckland Branch

Date and Time: 7.30 pm, Thursday 16 July 2009

Where: Room 3.407, School of Engineering, University of Auckland,
20 Symonds St, Auckland.

Speaker: Dr John Huckerby, (Executive Officer, Aotearoa Wave and Tidal Energy Association), is the founder and Executive Officer of the Aotearoa Wave and Tidal Energy Association (AWATEA), a marine energy industry association formed in April 2006. He is the current Chairman of the International Energy Agency's Ocean Energy Systems Executive (IEA:OES) and is also NZ's representative to the International Electrotechnical Commission's TC114, a technical committee set up to establish technical, environmental and performance standards for marine energy. More recently, he was appointed as a Lead Author of the Intergovernmental Panel on Climate Change's (IPCC) Special Report on Renewable Energy Resources and Climate Change Mitigation, which is due to be published in 2010.

John is also the director of Power Projects Limited, an energy industry consultancy advising on investments in New Zealand's energy industry. Power Projects is currently involved in the Wave Energy Technology-New Zealand (WET-NZ) R & D programme, which is developing a point-absorber wave energy converter.

John has a Ph.D. from Imperial College in London and an MBA from Henley Management College. He is a Chartered Engineer and a member of the Energy Institute, the Royal Society of New Zealand and the Institute of Directors in New Zealand.

Abstract: New Zealand is 94% water, yet the maritime industries contribute less than 1% of our GDP. Recent research has shown that New Zealand has substantial resources of both wave and tidal energy, which could be harnessed to meet our energy supply, address our energy security, create jobs in a new industry and develop an export industry.

The talk will address the size and distribution of our marine energy resources, national and international developments in marine energy technologies. The Government's support for marine energy and industry's enthusiasm to deploy are affected by issues such as resource consenting, environmental considerations and economic viability. The status of marine energy projects in New Zealand will be described along with initiatives in the wider international industry.

Web: www.esr.org.nz

Contact: Thomas Neitzert Ph 09-921 9258 thomas.neitzert@aut.ac.nz
(for more information. No booking required)

New Zealand urged to ratify Cluster Bomb Ban

New report details New Zealand's role in creation of the new treaty

Aotearoa New Zealand Cluster Coalition

Media Release – 29 May 2009

The New Zealand government needs to step up its ratification of the new treaty banning cluster bombs said the Aotearoa New Zealand Cluster Munition Coalition today.

“New Zealand was one of the first countries in the world to sign the treaty banning cluster bombs, but our ratification of this crucial agreement is lagging,” said Mary Wareham, coordinator of the Aotearoa New Zealand Cluster Munition Coalition (ANZCMC)*. “There is a clear humanitarian imperative to ensure that this treaty takes effect as quickly as possible to avoid future casualties from cluster bombs,” she added.

New Zealand played a central role in the creation of the 2008 Convention on Cluster Munitions, including as host to a crucial meeting in Wellington in February 2008. It was one of the first countries to sign the treaty on 3 December 2008. Legislation to implement the treaty must be passed before ratification, but the Bill still has not been introduced in Parliament. Minister for Disarmament and Arms Control, Hon. Georgina te Heuheu has told the coalition that ratification of the Convention on Cluster Munitions is her top priority.

The Convention on Cluster Munitions requires 30 ratifications to trigger entry into force six months later. A total of 96 governments have signed the Convention and seven have ratified. The ratifying states include five nations that led the process to create the treaty (Austria, Ireland, Holy See, Mexico, and Norway) and two countries where cluster munitions have been used (Laos and Sierra Leone).

“The new report issued today tells the compelling story of how New Zealand and other states heeded the call from survivors, deminers, and activists to ban cluster munitions, but further action is needed,” said Wareham. “To prevent further civilian casualties we urge all states to sign and ratify this treaty without delay,” she added.

Five Pacific governments have signed the Convention on Cluster Munitions (Cook Islands, Fiji, Nauru, Palau and Samoa) and other signatories include former producers, stockpilers and past users of cluster munitions. The treaty comprehensively prohibits cluster munitions and requires clearance of affected areas as well as comprehensive assistance to victims of the weapon.

According to the 288-page report, *Banning Cluster Munitions: Government*

Policy and Practice, the prohibition on cluster munitions is firmly taking hold as more countries join the new treaty banning the weapon and hold-out states shift their policies in the right direction. The ANZCMC is participating in a Global Week of Action Against Cluster Bombs, which is targeting non-signatories to join the treaty. The ANZCMC is a network of 23 non-government organisations and a member of the international campaign to ban cluster bombs.

From 01:00 GMT on 29 May *Banning Cluster Munitions* will be available online at: www.lm.icbl.org/cm/2009.

Contact: Mary Wareham, ANZCMC. Tel. +64-21-996-905, wareham@hrw.org

**Aotearoa NZ CMC members:* Amnesty International Aotearoa NZ, Aotearoa Lawyers for Peace, Auckland University Students' Association, Campaign Against Landmines, Caritas Aotearoa NZ, Christian World Service, Development Resource Centre, Engineers for Social Responsibility NZ, International Physicians for the Prevention of Nuclear War NZ, National Council of Women NZ, National Consultative Committee on Disarmament, Oxfam NZ, Parliamentarians for Nuclear Nonproliferation and Disarmament NZ, Pax Christi Aotearoa-NZ, Peace Foundation NZ, Peace Foundation Disarmament and Security Centre, Peace Movement Aotearoa, Soroptimist International NZ, Umma Trust, UN Association NZ, UN Youth Association NZ, UNICEF NZ, Women's International League for Peace and Freedom, Aotearoa.

Video at <http://www.vimeo.com/4716223>

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ESR-SEF Conference 2009

The ESR and SEF Committees regret to advise that they have found it not possible to hold the combined conference that had been proposed for later this year.

Although the suggested theme is very topical, neither group has people available with time to be able to carry out the necessary planning and preparation, including selection of appropriate speakers.

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Getting serious about renewable energy

Gerry Te Kapa Coates ¹

Most people are aware that the planet is facing a looming energy crisis with oil and gas soon slated to reach the peak of their production, and discoveries – if not now, then within the next decade. The fall in oil prices is but a temporary respite from a resumption of an inexorable upwards trend.

The combustion of fossil fuels is also accepted as the main culprit for global warming, now only contested by those who would deny any links with human culpability. How then are we to bridge the gap between our still growing energy needs, and a dwindling supply from conventional fossil fuelled sources?

The answer is “blowing in the wind” and from the varied array of what are called renewable resources – as distinct from exhaustible resources like oil and gas. They are called renewable because the natural powerhouse of the sun, provides us with renewed energy every day, in the form of direct sunlight or the solar energy that modifies our climate – the wind, rain, temperature differentials, and ability to grow plants (biomass) for fuel in the world.

The world's energy needs are expected to increase by over 50% by 2030, as the population continues to increase to almost 10 billion by 2050. Already almost a quarter of the world's population has no access to electricity, and many more rely on wood and dung for fuel for cooking and heating. To redress that inequity will also require more renewable energy.

Of the two existing international energy agencies, the International Energy Agency (IEA) is highly focussed on fossil fuels – oil, gas and coal, although at least now they are recognising how finite they are. The other body, the International Atomic Energy Agency (IAEA) is solely focussed on the peaceful development of nuclear energy, which also has its detractors. No agency exists that has as its central mission the assistance in the crucial transition that must be made from fossil fuels to renewables. At least the example of the IAEA shows how a single desk approach can be made to work in cooperation with the multi-faceted approach of the IEA.

The International Energy Agency (IEA) was set up by the Organisation for Economic Cooperation and Development during the oil crisis of 1973-74. Its initial role was to co-ordinate approaches in times of oil supply emergencies – a fact still reflected in the allocation of votes for its 28 members, based mainly on the oil consumption of the different countries. However as energy markets have

¹ Gerry Te Kapa Coates is a consultant and professional director, a past-President of the Institution of Professional Engineers NZ and past-Chair of the NZ Wind Energy Association. He is currently chair of the Marine Energy Deployment Fund evaluation panel 2009.

changed, the IEA's energy policy-making mandate has broadened to incorporate energy security, economic development and environmental protection. But because it deals with the whole range of energy issues, renewable energy is no more important than many other issues it deals with. This is true for a number of other advisory agencies – renewable energy is a minor part of their activities.

The International Atomic Energy Agency on the other hand is part of the United Nations family of independent advisers to its members on “planning for and using nuclear science and technology for various peaceful purposes”. It is an example of a technology specific advisory group.

The idea of an international agency solely to advise on and advocate for, renewable energy was first proposed in 1981 at a UN Conference on New and Renewable Sources of Energy in Nairobi. The idea was further strengthened following the World Summit on Sustainable Development (WSSD) in 2002. In 2004, the German Parliament again raised the issue of setting up an international renewable energy agency. A Preparatory Conference for the Foundation of an International Renewable Energy Agency (IRENA) was held in Berlin last April. The support has been strong enough – although not yet from New Zealand – to now hold the Founding Conference of IRENA in Bonn on 26 January 2009.

The purpose of a new body such as IRENA is to become a centre of excellence for the requirements of renewable energy, able to assist technology transfer about renewable energy, and provide experience of policies and practical applications. For example it could act as an international database on the efficacy of “feed-in tariffs” – a guaranteed price for which renewable energy will be bought by networks, which then enables investors to have confidence in future income.

IRENA will act as a facilitator and catalyst for renewable energy, supporting various research and development programmes, assisting national governments as well as the private sector. Its role should be to offer support on all issues relating to renewable energy, helping countries to benefit from the transfer of knowledge and experience of renewable energy technology.

As an independent international institution IRENA's role will also be to promote political processes that put renewable energy at centre stage in international political processes – whether they are to do with trade, investment, environment, energy or other issues.

One of the main advantages of renewable energy is in energy security. Renewable energy is home-grown, universally available and often locally available and not only reliant on an electricity grid or oil/gas pipeline infrastructures. Europe's ongoing problems with Russian gas getting through illustrates the problem only too clearly.

So far New Zealand – despite its huge renewable resources and leadership roles in several areas – has remained uncommitted to participating in the preparatory

conferences on IRENA. There is now a strong case for it to be represented alongside the 51 governments that attended the final preparatory conference. The cost of membership will not be high – in the low hundreds of thousands of dollars, not millions. But it is essential we have a participatory role.

It has often been said – the previous Energy Minister David Parker was noted for doing so – that in making the transition away from non-renewable fossil fuels to sustainable forms of energy, if New Zealand can't do it then few countries can. As a country that is fast on its feet, one that can lead with leading edge research, as well as follow trends faster than other countries with more inertia, and which is endowed with great resources – the “Saudi Arabia of wind” – New Zealand would be failing in its international duty to now stand on the sidelines of this important initiative.

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Emeritus Professor David Elms MNZM

Congratulations to ESR member **David Elms** who was awarded **Member of the NZ Order of Merit** in the Queen's Birthday honours. David, who is retired from the Department of Civil Engineering at Canterbury University, has led a distinguished career. He has published many papers on risk analysis particularly in relation to earthquakes and the behaviour of retaining structures. He is a Board member of the Centre for Advanced Engineering, the Academy Council and the Royal Society of NZ. He is a Fellow of IPENZ and the Royal Society. We congratulate David on his well earned award.

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ESR Subscriptions 2009 - 2010 year

We are most grateful to everyone who has responded very promptly to paying their annual subscriptions, either on line or by cheque. A total of \$3,165.00 including \$1,367.50 in donations to the Oxfam-Water for Survival programme and to \$517.5 and donations to ESR had been received by 1 June. Thank you for your generous contributions. Subscription notices were sent by email to everyone for who we have an email address. Others were posted. We do realise that sometimes intended emails end up in Spam boxes, so if you have not received your subscription notice please email johnlaroche@xtra.co.nz .

John La Roche - your avid subscription collector and part time National Secretary

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Dr Ian Prior

Dr Ian Prior was one of New Zealand's most distinguished epidemiologists, as well as a ground breaking environmentalist (the "Save Manapouri" campaign, and art lover. He was also a founder of the New Zealand branch of International Physicians for the Prevention of Nuclear War.

Ian was always very helpful to ESR when we were first getting established, inviting me to IPPNW's first conference in Wellington, and ensuring that engineers were mentioned in the same sentence as doctors about nuclear war. These early conferences were at a time when a young Labour MP Helen Clark was just making her mark. He also made sure we helped IPPNW fill the Wellington Town Hall for Dr Helen Caldicott's visit in 1984 promoting nuclear disarmament.

I spent many hours in the pleasant company of Ian and Eric Geiringer writing submissions, articles and other diatribes. He will be sadly missed not only by his family and friends but by the peace movement.

- Gerry Coates



EVs and the Mitsubishi iMiEV

Hayden Scott-Dye talked to the April meeting of ESR Auckland Branch about the Mitsubishi iMiEV electric car in the context of the partnership between Mitsubishi and Meridian.

Meridian Energy has partnered with Mitsubishi New Zealand to bring two iMiEVs into the country. They recently embarked on a two month long nationwide trial, with the aim of educating the public and getting kiwis excited about this great technology. This talk introduced electric vehicle technology, talked about the benefits of driving electric vehicles and touched on the key learnings by Meridian and Mitsubishi from the trial.

Hayden explained that there were a number of good reasons for this partnership and the introduction of the electric cars. The domestic electricity supply voltage of 230V gave the advantage of a shorter recharge time than would be the case in a country with a 110 volt supply. Some of the supporting reasons for adopting electric cars are that petrol is expensive, the average daily commute of NZers is less than 40 km, there is an existing high penetration of renewable energy in the electric power system with a target of 90% renewable by 2025 and there is a Ministry of Transport strategy of early adoption of electric vehicles.

Hayden compared the different families of personal electric transportation.

Hybrid Electric Vehicles (HEV) have electric motors along with a modest-sized petrol or diesel engine. A hybrid vehicle may be a series, parallel or series/parallel layout. In a series hybrid the electric motor is the only device that can power the drive shaft, so that the Internal Combustion (IC) engine acts purely as a generator. In a parallel hybrid, both the electric motor and IC engine can power the drive shaft. A series/parallel hybrid uses a combination of both layouts. The Toyota Prius is one example of a series/parallel hybrid. Hybrids employ regenerative braking to recharge the battery when slowing or coasting down hills. The battery will typically be of 1 to 3 kWh capacity.

A Plug-in Hybrid Electric Vehicle (PHEV) has a larger battery of approximately 16 kWh capacity. The PHEV behaves like an electric vehicle during the charge-depleting stage. Depending on the design of the vehicle the range achieved in this mode will vary. Once the charge has dropped to a certain threshold, the IC engine is used and the vehicle enters the charge sustaining mode, just like a conventional hybrid. The advantage of a PHEV is the ability to achieve greater distances, with the flexibility of being a Zero Emission Vehicle (ZEV) during short trips. The GM Volt is an example of a PHEV.

A Battery Electric Vehicle (BEV) has an even bigger battery. The Mitsubishi

iMiEV has a 16kWh battery capacity and the Tesla Roadster has a 52kWh capacity. The size of the battery depends on the performance required (essentially acceleration, which is dependant on vehicle mass) and the range required. Unlike the PHEV or HEV, a BEV has no IC engine.

Fuel cell vehicles have a number of disadvantages, such as the storage of hydrogen, the lack of supporting distribution infrastructure, and fuel cell stacks have poor durability or cycle life and have a very high price.

The Mitsubishi iMiEV weighs 1080 kg, and uses a Lithium-ion battery which is installed under the floor of the car, thus keeping the centre of gravity low to ensure stability. The configuration is a 4 door, with room for four people. The iMiEV has a 5-star frontal impact rating under the J-NCAP system.

Lithium-ion technology provides the best stored energy per weight of any of the current battery technologies: lead-acid, Nickel metal hydride, etc.

The batteries in the iMiEV can be fully charged in 7 hours, and provide a range of 160km. The distance achieved is based on the Japanese 10.15 drive cycle. A number of factors will affect the distance achieved from a full charge, these include: vehicle speed, payload, ambient weather conditions, ancillaries used in the vehicle and driver behaviour. A fast charge in about 20 minutes is possible but may be at the cost of decreased overall battery lifetime. Lithium ion technology shows no “memory” effect, unlike NiCd.

Comparative “Tank to wheel” efficiencies are: diesel 18%, petrol 15%, HEV 30%, iMiEV 67%. These efficiencies are quoted from the tank of the vehicle to the wheel so do not include losses involved in the refining and transportation of fuel or the losses incurred during electricity transmission.

The fuel (electricity) cost is approximately one quarter of the cost for petrol for a similar petrol vehicle, with one sixth of the CO₂ production of equivalent petrol-powered vehicles (based on the average NZ power generation mix). If the vehicle is supplied from purely renewable energy then there is no CO₂ production. In turn this results in a reduction in dependence on foreign oil and a reduction in expenditure on foreign exchange. There are also the benefits of no emissions from the vehicle.

Smart charging from the normal household supply is the most likely scenario where overnight charging is controlled by the state of the battery and the ability of the grid to supply power at any given moment. There is even the possibility of the car battery being used to help boost the grid at moments of peak load, but with limits on how far the car battery can be drawn down.

The Honourable Nick Smith has announced that Road User Charges will be

abolished for Electric Vehicles as an introductory measure to encourage EV uptake.

Global lithium resources meet expected demand out to at least 2020. Large lithium reserves reside in Bolivia, Argentina, Chile, the USA and China.

The iMiEV is expected to be on the market in Japan in about 2 months.

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Project to Promote Social Responsibility and Sustainability

ESR has been fortunate over the years to accumulate a healthy bank account. We have \$11,700 in a Business Saver account that has been earning interest and helping to keep our subscription fee low. However your committees in Auckland, Wellington and Christchurch feel that it is time to use some of this money for a project that will be of lasting benefit to promote social responsibility and sustainability. A booklet and/or a CD with articles by some of our very experienced “thinkers” and “doers” has been suggested. ESR founder, Gerry Te Kapa Coates and Susan Krumdieck from Christchurch have offered to be the editors. Their knowledge and expertise will be ideal for this task. We hope the booklet might be text for students and an essential guide for all those who feel a responsibility to leave our planet in better shape for future generations. There were also suggestions of providing awards for sustainable projects, but our funds are limited and we want to devote them to the best use.

Please let us know what you think by sending an email to johnlarochex@xtra.co.nz?

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Every gun that is made, every warship launched, every rocket fired signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and not clothed. This world in arms is not spending money alone. It is spending the sweat of its labourers, the genius of its scientists, the hopes of its children.

- President Eisenhower.

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Needed: A Copernican Shift

*A recent article from the Earth Policy Institute (www.earthpolicy.org/Books/Seg/EEch01_ss1.htm) reminds us that humanity is facing what might be termed a philosophical tipping point. It relates to the framework for policy development and the inability of mainstream economics to ensure that human development is sustainable. The following is an abridged version of that article, which in turn is adapted from Chapter 1, "The Economy and the Earth," in Lester R. Brown, *Eco-Economy: Building an Economy for the Earth* (New York: W.W. Norton & Company, 2001) (refer to www.earthpolicy.org/Books/Eco/index.htm).*

In 1543 the Polish astronomer Nicolaus Copernicus challenged the view that the sun revolved around the earth, arguing instead that the earth revolved around the sun. Today we need a similar shift in our worldview, in how we think about the relationship between the earth and the economy. The issue now is not which celestial sphere revolves around the other but whether the environment is part of the economy or the economy is part of the environment. Mainstream economists see the environment as a subset of the economy. Ecologists, on the other hand, see the economy as a subset of the environment.

Economic theory and economic indicators do not explain how the economy is disrupting and destroying the earth's natural systems. Worldwide trends mark an increasingly stressed relationship between the economy and the earth's ecosystem, with a growing economic toll. At some point, this could overwhelm the worldwide forces of progress, leading to economic decline.

An environmentally sustainable economy--an eco-economy--requires that the principles of ecology establish the framework for the formulation of economic policy and that economists and ecologists work together to fashion the new economy. Ecologists understand that all economic activity, indeed all life, depends on the earth's ecosystem. Economists know how to translate goals into policy. Economists and ecologists working together can design and build an eco-economy, one that can sustain progress.

These differences between ecology and economics are fundamental. For example, ecologists worry about limits, while economists tend not to recognize any such constraints. Ecologists, taking their cue from nature, think in terms of cycles, while economists are more likely to think linearly, or curvilinearly. Economists have a great faith in the market, while ecologists often fail to appreciate the market adequately.

The gap between economists and ecologists in their perception of the world as the 21st century began could not have been wider. Economists looked at the unprecedented growth of the global economy and of international trade and investment and forecast a promising future with more of the same. Ecologists looked at this same growth and realized that it was the product of burning vast quantities of artificially cheap fossil fuels, a process that destabilizes the climate. They looked ahead to see more intense heat waves, more destructive storms, melting ice caps, and rising sea levels that would shrink the land area even as population continued to grow. While economists saw booming economic indicators, ecologists saw an economy that is altering the climate with unthinkable consequences.

Economists rely on the market to guide their decision-making. They respect the market because it can allocate resources with an efficiency that a central planner can never match (as the Soviets learned at great expense). Ecologists view the market with less reverence because they see a market that is not telling the truth. For example, when buying a gallon of gasoline, customers in effect pay to get the oil out of the ground, refine it into gasoline, and deliver it to the local service station. But they do not pay the health care costs of treating respiratory illness from air pollution or the costs of climate disruption.

We have created an economy that is in conflict with its support systems, one that is fast depleting the earth's natural capital, moving the global economy onto an environmental path that will inevitably lead to economic decline. This economy cannot sustain economic progress; it cannot take us where we want to go. Just as Copernicus had to formulate a new astronomical worldview after several decades of celestial observations and mathematical calculations, we too must formulate a new economic worldview based on several decades of environmental observations and analyses. A stable relationship between the economy and the earth's ecosystem is essential if economic progress is to be sustained.

Although the idea that economics must be integrated into ecology may seem radical to many, evidence is mounting that it is the only approach that reflects reality. When observations no longer support theory, it is time to change the theory--what science historian Thomas Kuhn calls a paradigm shift. If the economy is a subset of the earth's ecosystem, the only formulation of economic policy that will succeed is one that respects the principles of ecology.

The good news is that economists are becoming more ecologically aware, recognizing the inherent dependence of the economy on the earth's ecosystem. For example, some 2,500 economists--including eight Nobel laureates--have endorsed the introduction of a carbon tax to stabilize climate. More and more economists are looking for ways to get the market to tell the ecological truth.

The existing industrial economic model cannot sustain economic progress. In our

short-sighted efforts to sustain the global economy, as currently structured, we are depleting the earth's natural capital. We spend a lot of time worrying about our economic deficits, but it is the ecological deficits that threaten our long-term economic future. Economic deficits are what we borrow from each other; ecological deficits are what we take from future generations.

- (John Peet)

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Canterbury Branch Office Holders

Fiona Cox has resigned and so we need a new treasurer/membership officer and John Peet's term as chairperson is up so we need a new chairperson. Susan Krumdieck has stepped up to the plate and will be taking over as chairperson. Lynn Torgerson will continue to carry on with the treasurer/membership officer duties until someone else can take it over.

Thanks to Fiona for her work over the years with respect to the membership and treasurer's duties. Also, a big thank you to John Peet for his continued work as chairperson even when he didn't want to do it! We are very grateful that he is still continuing on as committee member.

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Coming Events

10-12 July 2009

Environment and conservation Organisations of New Zealand Annual Conference 2009: **Greening our way out of a recession**

Karenga Camp, 79 Te Henga Road, Swanson, Auckland

Key topics include:

Ecological Economics, Sustainable business, Energy efficiency, Organics, Climate change, Resource Management Act.

Programme and registration available at www.eco.org.nz

For more information contact ECO: PO Box 11057, Wellington.

Ph 04 385 7545, Email. eco@eco.org.nz

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Challenges in the future for electricity distribution companies: Advanced Power Grids and Smart Grids

ESR Hamilton Branch Meeting

At the April meeting forty plus members appreciated a presentation by Dr. Julian Elder IPENZ member and CEO of WEL Networks. It was an excellent opportunity to welcome Julian as a new branch member and look forward to his future involvement in our activities.



[Hamilton] Branch members have grown well aware of the disjointed nature of the organisation and management of electricity generation and supply that has evolved through political intervention in the 1980s, so it came as no surprise to hear of Julian's concerns now that he has taken over the reins at WEL.

Even though the previous government had reversed the drop in funds for infrastructure we have still a long way to go to regain security of supply.

The holistic management systems for generation and distribution plant and lines routine maintenance and enhancement with age, together with the introduction of new efficiency gaining technologies that were the norm for NZED and local power boards are past. Today there remain process control gaps between the new 'corporate bodies' that manage the system.

Looking to the future for distribution companies, climate and technology changes are seen to be drivers for the services that distributors will provide. The aging of the existing assets provides the opportunity for the introduction of the new proven technologies. One example is in transmission: for example, the reinforcement and extension to the DC links to bring line losses down. The recognition that customers are getting smarter will change network demands – such things as increasing utilisation of ground coupled heat pumps and advanced lighting reducing heating demands, electric cars' plug in demands, and introduction of

various means of thermal storage. Movement into 'smart houses' as shown by the UK legislating that houses are to be carbon neutral within a period of time. Growth in PV, distributed generation and smart metering are just a few of the technology drivers.

Therefore there is an increasing role for integrated energy solutions.

Julian reported that WEL staff have taken on board this climate for change and put strategies forward to its board. It consistently spends \$35M per annum on new assets to recoup the neglect of the 1980s.

The changing structure of the market place is resulting in a more organizationally complex industry sector that needs monitoring and relevant action if security and efficiency gains are to be made.

The future distribution companies will need to develop and operate 'smart grids' to provide security of supply at optimum efficiency. As the above technologies and their uses gain a hold naturally load flow patterns throughout the network will be changing. In this situation the need for real time measurement and management control is essential if the efficiency gains are to be captured.

Traditionally real time measurement has been at high voltage terminal points (similarly for the gas supply network) but it is data at user level that is essential if these efficiencies are to be captured. Improved network connectivity allows for smart meters at point of power use to be introduced to provide instantaneous data from the 80,000 WEL customers. This provides the opportunity for immediate use reports for users in terms of current use and cost of electricity and gas, so they can optimise use. For WEL the power loss reports to the control room will result in immediate mitigating action.

Given the rapidly reducing availability of drinking water due to climate change, industrial developments and resulting contamination of water lodes, 'smart grids' for electricity and gas will ultimately extend to water resource management systems. This reveals the need for an early introduction of a two way RF system. The basis of the system is fibre optic based broadband. TV, radio, web access grids are part there already, so why not one fibre optic smart grid for NZ supplying all data needs as soon as possible?

During question time it was obvious that the topics stimulated stories from the engineers that carried out the design and building of the existing assets, reaffirming Julian's team's assessments of likely security risks.

From the active debate and questions from the floor Julian's presentation showed that it will not be long before the demand for Julian to return will have to be met.

- Norm Stannard

North Korea's Nuclear Test Message

By David Krieger

When a country tests a nuclear weapon, it is sending a message. It is not always clear, however, what that message is. In the case of the recent nuclear test by North Korea, some commentators have argued that the North Koreans are sending a “pay attention to me” message to the international community and particularly the United States. Other commentators have argued that the nuclear test was carried out for domestic purposes, to inspire the country with a display of technological prowess. A short statement from North Korea's Korean Central News Agency suggests that both international and domestic audiences were relevant to the bomb testing message.

The North Korean announcement indicated that the test had several purposes, including to “bolster up its nuclear deterrent for self-defense”; “settle the scientific and technological problems arising in further increasing the power of nuclear weapons”; “inspiring the army and people of the DPRK”; “contribute to defending the sovereignty of the country”; and “ensuring peace and security of the Korean Peninsula and the region around it...” These are worth examining.

First, the rationale for virtually all nuclear tests by all states has been to bolster a country's nuclear deterrent for the purpose of self-defense. The five permanent members of the UN Security Council, all nuclear powers, have tested nuclear weapons in total more than 2,000 times. The US alone has tested over 1,000 times. That means that North Korea, which has conducted two nuclear tests, has tested one thousandth the number of times as the five recognized nuclear weapons states have tested and one five-hundredth the number of times the US has tested. It is, of course, dead wrong that deterrence provides a country with protection. In fact, it may lead to a country being attacked by nuclear arms.

Second, learning more scientifically about the characteristics of nuclear detonations is another principal reason the nuclear weapons states have used to justify testing their weapons. The North Koreans are unusually blunt in stating that they are looking at problems arising from developing more powerful nuclear weapons. Their first test in 2006 had a force of about one kiloton. Their recent test had a force some four times greater, roughly one-third the power of the Hiroshima bomb.

Third, the North Koreans sought to inspire their army and people with their bomb test. It is unfortunate, but true that nuclear tests seem to inspire and promote nationalism. When the Indians and Pakistanis tested in 1998, their respective populations came into the streets celebrating the “achievement.” The US inspired its people by conducting over 1,000 nuclear tests, including 67 atmospheric tests in the Marshall Islands, then US Trust Territories, the equivalent of one Hiroshima bomb a day for 12 years.

Fourth, the belief that nuclear tests contribute to defending the sovereignty of a country seems wildly wrong. It may send a message regarding deterrence capability, but it is more relevant that it now isolates a country and makes it a pariah state. This wasn't always the case.

Fifth, it is also far from assured that North Korea's test and continued pursuit of a nuclear weapons capability will ensure peace on the Korean Peninsula and beyond.

There may be an argument that nuclear weapons assured peace between the US and Soviet Union during the Cold War, but this remains unproven and not subject to proof.

So taking the North Koreans at their word, they have done little more than demonstrate their technological prowess for domestic consumption and recaptured the attention of the world in a most negative way. President Obama responded to the latest nuclear and missile tests by saying that they posed “a grave threat to the peace and security of the world and I strongly condemn their reckless action.”

North Korea’s nuclear test is pushing it deeper into isolation from the international community. The tests may play well at home, but not on the world stage. At the same time, North Korea’s justifications for its tests are no better nor worse than those of the other countries that have tested. They are modelling their testing behavior on the nuclear weapons states that went before them.

The United States and other members of the United Nations Security Council, which are so strong in their condemnation of North Korea’s nuclear testing, are not doing enough to resolve important security issues with North Korea by diplomacy, the only sensible solution. Nor are the permanent members of the Security Council setting the right example by adhering to their own obligations under international law for “good faith” negotiations for total nuclear disarmament.

North Korea’s nuclear testing is a manifestation of a deeper problem in the international system, that of continuing to have a small group of countries possess and implicitly threaten the use of nuclear weapons for deterrence or any other reason.

David Krieger is president of the Nuclear Age Peace Foundation (www.wagingpeace.org).

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Email sent to Jim Salinger.

This is the text of an email sent to Jim Salinger following his recent dismissal by NIWA.

The committees of Engineers for Social Responsibility were shocked by your sudden dismissal from NIWA. We are greatly heartened by the many articles in the media expressing shock and concern at the way you were treated. Your scientific analysis of the changing climate is so important to everyone - even the disbelievers. Your expertise and continuing input into the international community should not be lost.

We extend our moral support to you in this distressing time. We do hope for your sake that some amicable settlement can be achieved with NIWA.

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ESR Yahoo Group Email Discussion

If you would like to join the ESR email discussion group, you should send a blank email message to ESRNZ-subscribe@yahoogroups.com .

Later, if you wish to drop out of the group, that is as easy as sending an email message to ESRNZ-unsubscribe@yahoogroups.com .

Web sites of interest

- INES Web Site www.inesglobal.com
- New Ines website <http://www.energysustainability.nl/>
- RedR New Zealand www.redrnz.org.nz
- Water for Survival www.oxfam.org.nz
- Sustainable Energy Forum www.sef.org.nz
- Campaign against Cluster Munitions www.stopclustermunitions.org
- Halliburton information www.halliburtonwatch.org

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Contributed articles and letters to the Editor are welcomed.

Viewpoints expressed by contributors to this Newsletter are their own and are not necessarily those of ESR.

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