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# Newsletter

July 2008  
Vol.24 No.3

**Engineers for Social Responsibility,  
Sustainable Energy Forum  
2008 Conference**

***Responding to Oil Depletion and Climate Change***

**Saturday 26 July 2008**

8.30am to 5.15pm

**Oakridge House, Unitec, Carrington Rd, Mt Albert, Auckland  
(Gate 4)**

Oil depletion is now being increasingly recognised as a significant and real risk to the way we live. The timing of a crisis is not known and many argue their points of view on this. But we think it is time to move on to examine the impacts and responses that might mitigate the worst side effects.

This year we have teamed up with the Sustainable Energy Forum (SEF) for the conference, and we hope to attract others who have not engaged with us before.

This year's conference will start with a recap of the main issues and then build onwards to review current responses. The outcome we hope will be a plan for a way forward: - how to respond to the challenges; how to broaden the base of our initiatives; and how to communicate these difficult topics to constituencies outside our professions. There is a line-up of exciting and well-informed speakers to inform us on all of this.

A Conference Programme and Registration Form is available from the Sustainable Energy Forum website at <http://www.sef.org.nz/conferences.html>.

Alternatively, email John La Roche at [johnlaroche@xtra.co.nz](mailto:johnlaroche@xtra.co.nz) for information and an application form.

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When you warn people about the dangers of climate change, they call you a saint.  
When you explain what needs to be done to stop it, they call you a communist.  
- George Monbiot

# Transformation Cities: Some dynamics in a post carbon world

Archer Davis

ESR Auckland Branch

**Date and Time:** 7.30pm, Thursday 21 August.

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

**Speaker:** Archer Davis.

**Abstract:** There's lots of information about Peak Oil and the energy descent – but how should we respond? Are the Doomers right that our familiar way of life will be swept suddenly away?

Or are the TechnoPolyannas right - new technologies will appear and we will go on as before?

In between these extremes we will probably muddle on as humans always do.

This talk is food for thought and feedback: it will cover the basics of Peak Oil and its economic impact, with some response to each of the scenarios.

**Web:** [www.esr.org.nz](http://www.esr.org.nz)

**Contact:** Thomas Neitzert at [thomas.neitzert@aut.ac.nz](mailto:thomas.neitzert@aut.ac.nz).

## **An Introduction to Ethics and Climate Change: Are New Ethical, Economic and Governance Systems Required**

Dr Robert Howell

Dr Robert Howell spoke to the May ESR Auckland Branch Meeting and gave a very extensive review of many of the ethical issues that arise in dealing with the challenges of climate change.

The scientific community's assessment of the warming of the climate system is unequivocal: global warming is happening and the temperature will increase to and beyond a level that is dangerous to human life. Avoiding dangerous increases is no longer possible to achieve: no mitigation effort will prevent climate change from happening in the next few decades. Adaptation is unavoidable.

In the policy forums and documents, such as the IPCC and the UNFCCC, and in the academic literature, there are various references to, or assumptions of, ethical principles. The three most cited ethical philosophers or streams are the Utilitarianists, Kant and Rawls, and the most prominent concept is equity. The policy issues include how to allocate responsibility for the cause, the reduction (mitigation), and coping with the impacts of greenhouse gas emissions (adaptation), between existing nations and current and future generations. How should we use (if at all) the concepts or methods of polluter pays; ability to pay, distributing the benefits, the role of the market; sovereignty rights; equity? What decision making process should be used? Some of the debates in the international arena acknowledge the values of certain ethical traditions (such as utilitarianism), some are used but not acknowledged or recognised (such as the Lockean social contract), and some are completely ignored (such as the Aristotelian and Biocentric/Indigenous ethical traditions).

Neoclassical economics is based on the belief that the unregulated and competitive market is the best method for the allocation of resources. Individuals respond to prices on goods and services, which leads to the efficient maximization of social welfare. Cost benefit analyses show a wide variation of the cost of carbon. But this is a result of the assumptions chosen, rather than the methodology, and many of these assumptions have an ethical component. Ecological economists, on the other hand, do not accept the basic assumptions of the neoclassical framework; the fundamentals of neoclassical economics are in conflict with the fundamentals of science. The First Law of Thermodynamics states that all matter and energy in the universe is constant, that it cannot be created or destroyed. The Second Law (entropy law) states that matter and energy can only be changed in one direction, from usable to unusable, from

ordered to disordered. The disputes are about resource flows for sustainability, relative versus absolute scarcity, and substitutability. Ecological economists are critical of many cost benefit analyses.

Neither science nor economics can resolve the fundamental issues posed by climate change; these are ethical issues. Six traditional streams are briefly described, followed by a description of some of the modern ethical accounts that draw on these traditions. These are related to the fundamental principles of science and how different economics rests on a number of these different ethical traditions. Some of these ethical theories are inherently contradictory, in contradiction with science, or contrary to basic moral understandings. Some have minimal potency to guide policy. The ethical debate includes consideration of how to value humans, animals and plants and the systems in which they live. Very simply, there are choices between valuing non-human life as instrumental or intrinsic (having value only in how it benefits humans, or having value independent of use to humans). The question is posed "Would an ethic concerned with instrumental value for non-human entities and systems, if inserted in the charters of Exxon Mobil, General Motors, Walmart, Citicorp or British Tobacco, be sufficient to redirect these transnationals to behaviour that is a positive contribution to the problems posed by climate change?" An ethic based on instrumental values is not adequate. A different ethic is required, which is not new, but is new to the way humans currently live.

Where weight is given to one prominent concept, such as **duty**, or **utility** or **equity**, then it is apparent that the richness and complexity of living in this world cannot be captured in that one concept. There is much value in taking an Aristotelian approach which sees a set of key moral characteristics or qualities, although there will be questions of priority of obligations where there are clashes arising from different notions. There could also be different sets of concepts. Candidates include: Self preservation, Equity, Integrity, Oneness, Intrinsic value, Resilience, Simplicity, Stewardship, Respect and Reverence for Life.

A new ethic, however, while necessary, is not sufficient. If it is to have any effect in addressing the challenge of climate change, a new ethic must be translated into policy affecting global, national and local behaviour, and in particular a new economics. The UNFCC's Articles and Principles are not based on sustainable, economic, ethical and governance models that will enable the UNFCC to achieve the purpose of avoiding dangerous climate change. This means instituting new global governance and economic arrangements.

Ultimately, we need to develop a new way of relating with nature. Contemporary Western cultures have very few positive images of that natural world. We see nature as rural not urban, as a threat to where and how we live, as providing resources for us to transform our buildings and landscapes into our advertising image of the good life. Many indigenous cultures have stories that teach respect for non-human entities and systems, an Aristotelian *phronesis*, or a spiritual

world view. We need to develop such stories and adopt such frameworks. These values need to be present at a personal level but also at an institutional and organisational level locally, nationally and globally, and in laws, professional rules, organisational charters, policies, codes of conduct, creeds and religious doctrines, cultural customs through myths, stories, and traditions, if we have time!

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## Membership Subscriptions

We have been delighted by the rapid response from members to the on-line payment of subscriptions and conference registrations. The new system has certainly reduced our workload and hopefully yours too. It's just great to do it all from my computer at home.

And also we are grateful all those who have opted for the electronic newsletter. This will significantly reduce our costs in printing and postage. It is certainly the environmentally responsible thing to do.

Your Membership Secretary apologises for an error on the form stating Discounts were available for payment before 1 June. This was before the forms were sent out! It should have been 1 July, but in view of this we will extend the discount period until 15 July. Most of those who paid already without deducting the discount, have agreed to make the extra a donation to ESR. Receipts for donations of \$5.00 or more have been issued to enable a tax deduction to be claimed. ESR has applied for Charitable status and we hope this will all be confirmed before the end of the tax year.

For those who have not yet paid, the email request with forms was sent out on 10 June. If you would like another form please email [johnlaroch@xtra.co.nz](mailto:johnlaroch@xtra.co.nz). And of course if you prefer you can still write a cheque and post it to ESR P O Box 6208 Wellesley Street, Auckland 1141.

John La Roche, Membership Secretary

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"A time comes when silence is betrayal." - Rev. Martin Luther King

## Understanding Peak Oil

Neil Jacka talked to ESR Auckland on 13 March 2008 about the advent of Peak Oil, what that means and some possible future scenarios.

**“Oil has become more and more necessary to everyone. At first it was used for medicine, for lamps, and for lubrication. Now, if the supply of oil were cut off, our manner of living would change completely until something to take its place was found.”**

This quote was taken from a presentation by Gerry Coates at last years ESR conference. This observation was penned by American writers and illustrators Maud and Miska Petersham in 1935.

Since this was written, the daily global consumption of oil has risen from 3.5 million barrels per day to 86 million barrels per day. It permeates almost every aspect of our lives. Oil was first used almost 150 years ago as a substitute for Whale oil in lamps. Oil is the most concentrated liquid energy ever discovered providing about 1700kWh/barrel). It now provides mobility on demand and has artificially raised the carrying capacity of the earth.

Peak oil is the term used for the moment in time when production of oil peaks due to natural physical constraints. It is important because our society runs on oil. All primary resources are mined and refined using oil-driven machinery and processes reliant on oil-energy inputs. Plastics, fertilisers and pesticides are oil-derived. All of our distribution networks are driven by oil.

Oil was created in two prime epochs, 90 million and 150 million years ago. During these periods of extreme global warming, large pools of algae formed, photo-synthesizing solar energy into organic carbon. The organic debris formed kerogen, the raw material for oil, as it collected in the broad rifts formed as continents moved apart.

The organic debris was eventually buried as the rifts were infilled by sediments washed in by rivers. When buried to about 2000m, the heat and pressure caused the chemical reactions required to convert it to oil and gas. The product is the most convenient fuel source ever discovered. The oil, once formed, moved upwards through the pores in the rock finding its way into geological traps formed by the folded and faulted layers of younger sediments above.

An oil reservoir requires a sandy geological formation allowing the oil to displace the water in the pores between the sand grains as the oil moves upwards. A folded or faulted upper layer of clay acts as a seal trapping the oil until discovered and tapped by an oil well. The grainier the sand and the thinner the oil, the easier the extraction of the oil.

Oil is a finite resource, the one-time endowment of stored solar energy created from organic matter by a unique combination of geological conditions. When it is gone, it is gone!

The rate of extraction from one well-point is limited by the permeability of the oil-bearing sandstone and the viscosity of the oil. Because of this limit on the rate of extraction, most oil wells have a long, fairly stable production plateau.

The rate of production from an oil field can be increased by increasing the number of wells, effectively closing up the spacing between each well. Although this increases the extraction rate by tapping the field with multiple wells, it reduces the life expectancy of each well due to its decreased catchment of oil bearing rock.

The production of an oil field can be shown as a bell-shaped curve which is the sum of the output of all the wells in that field. The mathematical shape of the curve was discovered by M King Hubbert, a senior oil industry geologist. In 1956, Hubbert predicted that US oil production would peak in 1970. Hubbert made his predictions at a time when the US was awash in cheap oil. The post-war economy was booming. Hubbert and his views were generally dismissed by the oil industry until it became evident in the late 70s that US production had indeed peaked in 1971.

The area under the curve represents the volume of the reserve. Output, or production rises as wells and infrastructure are installed to exploit the resource. The oil extracted during this phase is the easiest-won and is often the light or “sweet” crude. At some point, production peaks. This peak appears to occur when half of the available resource has been extracted, after which production rates decline. The oil available in this depletion phase is often the heavier or “sour” crude and is more difficult to extract and refine.

The production could have a high, narrow peak or a low broad peak, depending on the size and characteristics of the reserve and the rate of extraction. But the life cycle of a field or any aggregate collection of fields follows a distinctive bell shape.

There are some basic rules about discovery and production

1. **Oil must be discovered before it can be produced**
2. **Because oil is a finite resource, the discovery of oil will eventually peak.**
3. **Oil production must follow discovery**
4. **Oil production peaks sometime after discovery peaks**

Looking at a graph of production in the US-Lower 48, which is the world’s most

mature area, we see that discovery peaked in 1930 giving the corresponding peak of production 40 years later - in 1970.

- This is a relatively long time-lapse, because technology was primitive in those early days.
- Also, the United States had a unique environment with the landowner owning the mineral rights, meaning there were many small operators.
- Production has been in relentless decline for 35 years. Nothing can change it.
- It explains why the United States is so desperate to secure access foreign oil, if necessary by military means.

Hubbert predicted in 1956 that US oil production would peak. The graph shows Hubbert's prediction curve developed in 1960. It fits the production curve quite accurately. The US reserves of oil are into the rapid phase of depletion. The oil that is left is expensive to extract and refine.

Indonesia has had a long oil history. It was the birthplace of Shell Oil in the 19th Century. An early cycle of onshore discovery peaked in the 1940s, and was followed by a second offshore peak in the early 1970s. The discovery cycles were faithfully reflected in production. Production is now in terminal decline at about 3.5% a year. The country has no good reason for remaining a member of OPEC, as it becomes an importer. It is a populous country of some 218 million which needs more than it can produce.

The United Kingdom shows the same classic pattern. Discovery peaked in the 1970s as the giant North Sea fields came in. That delivered a corresponding peak in production in 1999. It is now declining at about 6% a year. The brief fall in production in the 1990s was due mainly to the Piper Field accident which closed several platforms for maintenance and improved safety.

***Most of world's remaining oil is in the Middle East, under Government control***  
Strong reserves are vital to their economies. OPEC production quotas are linked to reserves.

***The private reserves of oil companies is commercially sensitive***

Conservative reserve reporting leads to gradual reserve appreciation. This gives the impression of inflated discovery.

Let us look at how OPEC reported.

In 1980, Kuwait reported reserves of 65 Gb (billion barrels), which has fallen to 64 Gb by 1984. 22 Gb had been produced by then, meaning that a total of 86 Gb had been discovered. In the following year, it increased its report to an implausible 90 Gb. In other words, it reported about what it had found, not what

remained. It did so because OPEC quota was based on reserves, and prices were low.

At first, the other countries did not know how to react. But when in 1987 Kuwait increased again to 92 Gb, it was the straw that broke the camel's back. Abu Dhabi announced 92 Gb (exactly the same as Kuwait), up from 31 Gb. Iran went one better at 93, while Iraq, not to be outdone, came in with a rounded 100 Gb. Venezuela could not match but doubled its reserves from 25 to 56 Gb. Saudi Arabia also could not match Kuwait because it was already reporting more, but in 1990 increased from 170 to 259 Gb following Kuwait's example of reporting the total found, not the amount remaining. But, significantly, the Neutral Zone, which is shared by Saudi Arabia and Kuwait, announced no such increase – presumably because its two owners had no common motive.

This explains why the reports have barely changed since, despite massive production. It is remarkable that such a flawed dataset is routinely reproduced without comment.

Colin Campbell of ASPO has analysed the reported discoveries. What he found was that newly discovered oilfields amounted to only 15% of last 15 year's discovery. The remainder all came from reserve appreciation. Under the current economic rules this makes sense as companies report just what is needed to support their business plan. Why take risks with reporting the last portions of a reserve that may be difficult to produce?

In North-West Europe, there is a prolific belt of oil generation lying in a Jurassic rift, which formed as the Atlantic began to open 150 million years ago: the older of the two prime generation epochs. It is the largest new province found since the Second World War, holding about 60 billion barrels, enough to supply the world for less than three years.

The world has been studied enough to find all the major productive areas. They are not difficult to identify once the key information has been gathered from a few initial boreholes. But some possibilities remain for smaller new areas with leaner sources. Mining coal or minerals is largely a matter of concentration. Lower concentrations become viable if prices rise or costs fall. But oil is different. It has a certain polarity; it is either there in profitable abundance, or it is not there at all. That reflects the rare occurrence of prolific source-rocks in Nature.

Discovery keeps falling despite record levels of investment in exploration.

- Large oil companies destroyed value in the North Sea by going on exploring
- The 10 largest private oil companies, between 2000 and 2003, discovered oil with a NPV of \$4billion at a cost of \$8bn

- Tax offsets make exploring possible - the 10 cent dollar
- Future development now requires high oil prices
- So far discovery is still falling

Companies now go to great lengths to extract oil. Huge rigs are now deployed to areas like the gulf of Mexico. They may be up to 270km from shore, drilling in 9km of water, and located in what is known as hurricane alley. The Resource Value is of some 3-15B barrels, about 1.5 to 6 months of the current world consumption of 85Mbbbl per day.

Globally, consumption exceeded discovery in 1981, and the gap is widening. We are now consuming five barrels of oil for each new barrel discovered. So oil has already peaked. More drilling does not help.

***53 countries are past peak, and this includes major producers.***

**Pre-1970** - Austria, Germany

**1970s** - Venezuela, Bahrain, Ukraine, Libya, USA, Turkmenistan, Canada, Iran, Romania, Indonesia, Trinidad, Brunei, Algeria

**1980s** – Tunisia, Chile, Albania, Peru, Cameroon, Brazil, Hungary, Russia, France, Croatia, Netherlands

**1990s** – Turkey, Dubai, Pakistan, Papua, Syria, Egypt, Gabon, Argentina, Angola, Sharjah, Uzbekistan, UK, Colombia, Yemen

**2000s** – Mexico, Nigeria, Norway, N. Zone, Oman, India, Qatar, Malaysia, Australia, Ecuador, Denmark, Congo, Italy

The only question remaining is when does global production peak. The answer seems to hinge on when Saudi Arabia peaks.

Matt Simmons is a respected energy investment broker. In his book “Twilight in the Desert - The coming Saudi oil shock and the world economy” he comments that when Saudi Arabia peaks, so will the world. He notes:

- 5 super giant oilfields made up 90% of oil output.
- 3 giant oilfields made up 8%.
- These oilfields are between 40 and 60 years old.
- All are reaching point of decline.
- Half of “proven reserves” are “questionable.”
- Remaining oil is harder to produce.

The forecast timing of the peak has been hotly debated for the last five years. The early peakers comprise respected senior oil industry insiders – one would

almost call them whistle blowers. The international energy agency after steadfastly denying a problem before 2030 has recently accepted that supply conditions could “tighten” beyond 2012.

We can look at two previous oil interruptions to see what happened then. For the 1973 and 1979 interruptions, the outcome was of inflation, recession, unemployment and high interest rates – and those interruptions were relatively brief! World oil peaking impacts could last a decade or more. **The world has never faced a problem like oil peaking.**

In 2005 the US State Department engaged Robert Hirsch to investigate this peak oil thing. He attempted to estimate the measured necessary to mitigate the effects of the peaking of oil. His report was subsequently buried only to be discovered by Richard Heinberg on a high school website.

Hirsch’s introductory conclusion. “The peaking of world oil presents the US and the world with an unprecedented risk management problem. As peaking is approached, liquid fuel prices and price volatility will increase dramatically, and, without timely mitigation, the economic, social, and political costs will be unprecedented. Viable mitigation options exist on both the supply and demand sides, but to have substantial impact, they must be initiated more than a decade in advance of peaking.”

Oil prices soar above \$60, which is rapidly being seen as more of a floor than a ceiling. Yet in hindsight, we can see that the trend has been building for several years. High prices represent profiteering from shortage, being about five times production cost. We may face a serious of vicious circles of Price Shock – Recession – Demand fall – Price collapse – Recovery – Price Shock. But by around, say, 2010, the perception of permanent decline may have led to a new reality and stability.

Alternative technologies include:

- Coal to liquids
- Gas to liquids
- Tar Sands
- Oil Shale
- Hydrogen
- Agri-fuels

The concept of ‘net energy’ or EROEI needs to be a critical component of any analysis of options.

There will be effects on the economy.

- Fuel prices rise.

- Commodity prices rise (inflation).
- Consumer activity falls, dampening demand (demand destruction).
- Production falls.
- Unemployment rises.

Take the broadest economic and historical view that you can.

- Economic activity and population growth are supported by available energy.
- GDP is closely correlated to Oil Production
- World population has risen due to (the mostly early, massive) benefits of oil. There was a six-fold increase during the First Half of the Age of Oil.

Will the population have to shrink in parallel with the decline of oil during the Second Half? There are likely to be dramatic changes in the lifetime of a child born in 1990, as oil supplies run low.

Responses to Peak Oil include:

- International Response. (Oil Depletion Protocol)
- Regional response
- Local Response (relocalisation networks and Transition Towns.
- Personal response

#### **Web-Based Resources**

- Richard Heinberg's Museletter
- Association for Study of Peak Oil
- The Oil Drum
- Transition Towns Aotearoa
- "View from the top" by Simon Tegg

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## **Register of Engineers for Disaster Relief NZ Annual General Meeting**

The Annual General Meeting of RedR NZ will be held at 6.00pm on Tuesday 22 July. The venue will be the Chapel Lecture Theatre, Block 1, Unitec, Gate 1 Carrington Rd, Mt Albert, Auckland.

After the formal business of the AGM, Prof Regan Potangaroa will speak to us of his experiences at all levels of humanitarian disaster relief; from the 'coal face' in locations as far apart as Sudan and Aceh, through to the highest levels of the UN in Geneva. He will introduce us to the good and the bad, the beautiful and the downright ugly that one encounters in this work.

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## Exploration of Knowledge System Synergies for Integrated Sustainability Assessment

Te Kipa Kepa Brian Morgan [k.morgan@auckland.ac.nz](mailto:k.morgan@auckland.ac.nz)

Members may be interested in my doctoral research which I recently submitted. It is unlikely to be examined until I return from Hawaii in July but the attached 2 pager gives a reasonable description of the work. I anticipate running some seminars/workshops if there is sufficient interest.

The fourfold focus of sustainability assessment in New Zealand based on Environmental, Cultural, Economic and Social well-being has its limitations when interpreted within the contemporary context of economic rationalism dominating the Western World. Economic rationalism is driving a political expediency in decision making that over-values monetary based (economic) performance indicators. Such decision making struggles to adequately represent the broader environmental, social and cultural implications, and continues the historic debasement of our ecosystems, cultures, and societies.

Sustainability assessment and decision making needs to be situated in a context of longer, broader and deeper views, beyond the immediate horizon of contemporary Western thought. The widespread Māori opposition to municipal engineering wastewater practices is symptomatic of this need, and signals an opportunity for improved communication and understanding. The historic competition of Western Science with Indigenous Knowledge has perpetuated a paradigm of exclusion however, preventing the earlier combination of these taonga in a collaborative fashion for our collective well-being. By integrating these knowledge systems this research has developed a decision making framework that communicates sustainability issues equally well in both the indigenous and scientific paradigms.

The research questions addressed within this research with regard to resource management and sustainable development include:

- What are the priorities for sustainability decision making in Aotearoa NZ?
- Should the environment's life supporting capacity be preserved for the sake of humankind (instrumental value) or for its own sake (intrinsic value)?
- What relevance does Indigenous Knowledge have? Does it offer anything that is absent in the Western scientific approach? Does a basis exist for the inclusion of Indigenous Knowledge?
- Which Indigenous Knowledge concepts would be appropriate for decision making, and how would a decision making process ensure that

the adoption of these concepts makes a beneficial and consistent contribution?

The potential synergy that exists between Indigenous Knowledge and society's legislated aspirations for sustainability is investigated. The research methodology addresses the requirements of sustainable development from an 'intrinsic value of the environment' perspective. The fundamental advantage being that the approach is holistic, the very attribute necessary for truly sustainable development. Aspects of systems thinking and complexity science are integrated. A workshop process is also proposed for later evaluation of the decision making framework.

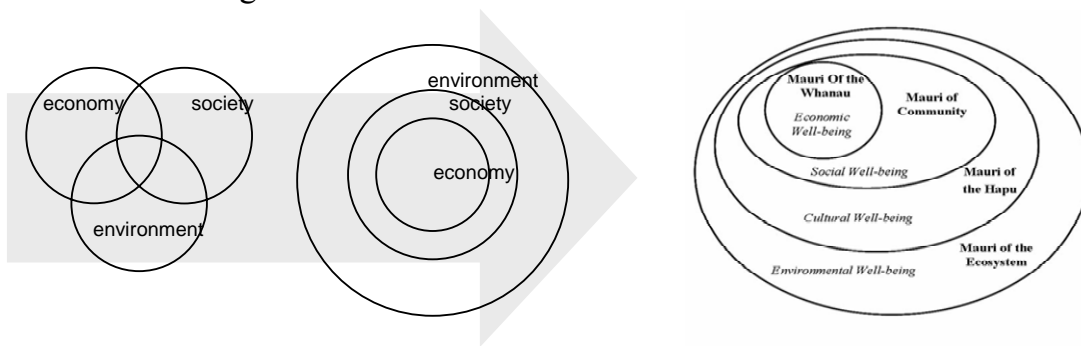


Figure 1: Sustainability Model Progression towards understanding the Intrinsic Value of Environment

A decision making framework (DMF) is designed incorporating the essential attributes required in a decision support tool. The Mauri Model integrates the intrinsic value of ecosystems (environmental), hapū or clan group (cultural), whanau or family (economic), and communities (social) using the indigenous concept of mauri as the performance metric across all four sustainability dimensions. Mauri is the binding force between the physical and the spiritual, and it is the basis of kaitiakitanga (guardianship) as this is the ethic of working to enhance the mauri of all things around us. Mauri is considered as a potential metric for sustainability assessment and multi-criterion decision making.

Mauri bonds the spiritual and the physical and when this bond is extinguished the result is death in a living organism or alternatively the loss of capacity to support life in a material such as water or soil. The DMF incorporates this concept to determine whether the mauri of each dimension is being fully restored, enhanced, maintained, diminished, or denigrated / destroyed. This allows determination of the environmental, economic, social, and cultural sustainability of different courses of action. The use of mauri rather than money as the measure of sustainability avoids the constrained analysis of decisions based solely on pseudo-economic considerations.

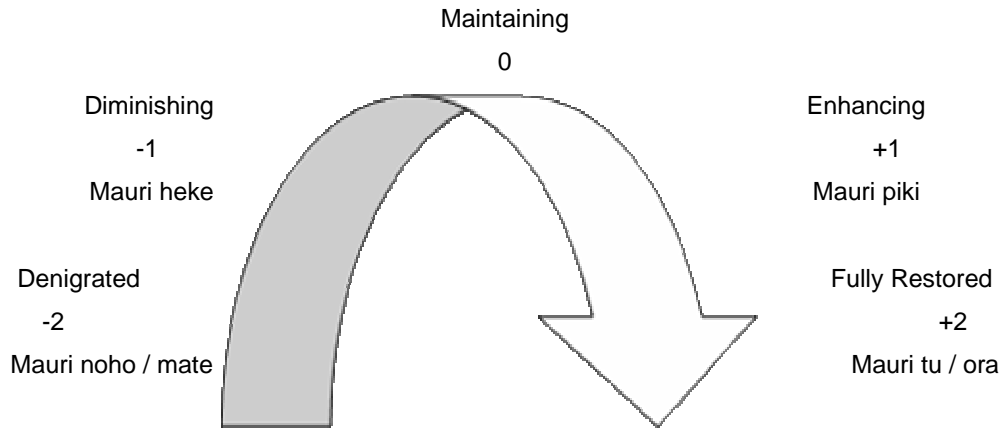


Figure 2: Mauri Barometer for Sustainability Assessment

The Mauri Model DMF has been the focus of a series of facilitated workshops involving territorial and regional authorities, hapū, Māori professionals, and the Institution of Professional Engineers NZ. The Mauri Model has produced equally valid outcomes from these workshops involving indigenous communities and professional engineers with strong agreement regarding the sustainability of common western engineering approaches such as wastewater. The Mauri Model was found to satisfactorily integrate the mauri of ecosystems, hapū, whanau, and communities; as a unique performance metric aligned to the sustainability dimensions identified in legislation, for improved management of our future well-being.

Effective community commitment to sustainability is a significant global challenge. Therefore the modification of the Mauri Model to suit other cultural contexts within the Pacific and the Pacific Rim is the future focus.

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## Newsletters by Email

A significant number of members now receive their Newsletter by email. There is obviously a saving for ESR in the cost of printing and postage, so if you would like to receive your newsletter electronically, please let us know by sending an email to [johnlaroch@xtra.co.nz](mailto:johnlaroch@xtra.co.nz)

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Wars are poor chisels for carving out peaceful tomorrows.  
- Martin Luther King, Jr.

## **Cluster Munition Convention Agreed**

Ten years after the signing of the Landmine Ban Treaty in Ottawa, December 1997, a further major treaty has been agreed upon. This Oxfam Press Release gives some details.

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(Dublin, Ireland) After nearly two weeks of intense talks in Dublin, negotiating states informally agreed late Wednesday to ban cluster munitions. Governments will formally adopt the Cluster Munition Convention on Friday, May 30 2008, and it will be opened for signature on December 2 2008.

“With several crucial issues to be resolved these talks have been touch-and-go since the outset, but tonight we achieved our goal when government agreed in principal to ban cluster munitions,” says Mary Wareham of Oxfam New Zealand, coordinator of the Aotearoa New Zealand Cluster Munition Coalition. “The New Zealand government and public should be proud of the crucial role they played in securing this agreement.”

New Zealand’s Ambassador Don MacKay played a central role in the treaty negotiations by chairing critical side talks on the definition of a cluster munition, while civil society groups and members of the public were central to ensuring the success of the Wellington Conference on Cluster Munitions in February 2008, the final step in the process that led to the Dublin negotiations.

“With the strong definition contained in this treaty we will outlaw every type of cluster munition that has ever been used, as well as almost all cluster munitions in arsenals of the countries that are expected to sign the agreement,” said Wareham. “This is the most significant advance in disarmament law in over a decade; we are celebrating a major break through.”

Tonight’s provisional text will be formally adopted on Friday morning (at approx 11.00 GMT on Friday May 30), after delegations have had a chance to report back to their national capitals on the tentative outcome of the talks. The treaty includes strong provisions on all of the key issues: rejecting calls for a transition period - which would have allowed states to continue using cluster munitions and sets a maximum time limit on stockpile destruction.

A total of 126 government representatives have been part of the negotiations in Dublin, joined by more than 275 campaigners, field deminers, and cluster munition survivors from 61 countries. Wareham has played a central role in the Dublin negotiations, as the coordinator of the Aotearoa New Zealand Cluster Munition Coalition.

Contact: Mary Wareham, Oxfam NZ, +353 (83) 359-0130 (Ireland mobile)

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Editors notes:

\* Oxfam New Zealand coordinates the Aotearoa New Zealand Cluster Munition Coalition, a national network of non-governmental groups established in March 2007 to support the global campaign against cluster munitions. See: [www.stopclusterbombs.org.nz](http://www.stopclusterbombs.org.nz)

\* Cluster munitions stand out as the weapon that poses the gravest dangers to civilians since antipersonnel mines, which were banned in 1997, causing more civilian casualties in Iraq in 2003 and Kosovo in 1999 than any other weapon system. Israel's massive use of the weapon in Lebanon in August 2006 resulted in more than 200 civilian casualties in the year following the ceasefire and served as the catalyst that has propelled governments to secure a legally-binding international instrument tackling cluster munitions in 2008.

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## **Cluster Munitions**

In his talk to the ESR Auckland Branch on 19 June, Lawrence Carter told us of the horrific effects of cluster munitions on people, then went on to describe the construction and deployment of the weapon. He then told us of the worldwide campaign to have them banned and the successful outcome of that.

With further illustration from the video "Unacceptable Harm" by Chris Anderson, Lawrence showed us the drastic effects on civilian populations of the weapons, whether on first deployment or as an outcome of the non-detonation of scattered bomblets. Children are most at risk from "failed" cluster munitions.

He described the make-up of cluster weapons, as a wide-area coverage bomb. Large containers contain up to a couple of hundred sub-munitions or bomblets which are designed to detonate above ground or on impact. Dispersal is by artillery shell, aerial dropped bomb, or from a rocket or missile. Most stockpiled cluster munitions are now believed to be ground-based systems.

They are designed for one or more of several purposes: fragmentation devices, armour-piercing, or combined-effect, sometimes with an incendiary element as well. Lawrence illustrated this with technical details on the CBU-87 system.

The weapons are notoriously unreliable in use, in spite of claims made by the manufacturers and the military users. The duds are a menace, especially for civilian populations as they try to return to normal life after a conflict.

In Lebanon, 2006, Israel dropped as many as 4.6 million sub-munitions on Lebanon, even though a cease-fire was expected in several days. Many were of the M85 type which has a self-destruct mechanism which supposedly gives a failure rate of 1%. In practice the failure rate is 10% or more.

The campaign against cluster munitions is a development of the famous and successful campaign against landmines of the 1990s. It was led since 2003 by the Cluster Munitions Coalition, a network of some 200 civil society organisations. ESR is a member of that, and also of the New Zealand group CMC Aotearoa-NZ.

In late 2006 Norway declared its intention to work towards an international ban on those CMs “which have an unacceptable humanitarian impact”. In February 2007, a group of States, the UN, ICRC, CMC and others met in Oslo and produced the Oslo Declaration which forms the basis for the current Oslo Process. States are to commit themselves to conclude (by the end of 2008) a treaty to prohibit the use, production, transfer and stockpiling of CMs that cause unacceptable harm to civilians. A draft treaty text was prepared and discussed and refined in States meetings in Lima (May 2007), San Jose, Belgrade, Brussels, Vienna, Wellington and Dublin (May 2008)

The Wellington Conference was in February 2008, in the Wellington Town Hall, chaired by NZ Ambassador Don McKay. Its outcome was that the draft treaty was preserved unchanged, and that the concerns of the treaty-weakening states were contained in a ‘compendium’, of doubtful status. Absentees included the United States, Russia, China, Israel, India and Pakistan.

The Dublin conference in May 2008 negotiated the final wording of the Treaty. There were the same issues; exemptions, delays, interoperability. And there was the ‘invisible presence’ of the United States. Finally, a strong treaty was agreed, although there are some loopholes. There is to be a Meeting in Oslo in late 2008 at which the Treaty will be signed. We expect New Zealand to sign it, and we look forward to its early ratification.

Now that we have an established procedure for outlawing weapons that cause unacceptable harm to civilians, the Ottawa Process for landmines, and the Oslo process for cluster munitions, what should be the next step? Can we have a Wellington Process to ban nuclear weapons?

## **Resources**

[www.stopclustermunitions.org](http://www.stopclustermunitions.org)

[www.ckingassociates.co.uk](http://www.ckingassociates.co.uk)

[www.gichd.org](http://www.gichd.org)

[www.ffi.no](http://www.ffi.no)

[www.npaid.org](http://www.npaid.org)

[www.handicapinternational.be](http://www.handicapinternational.be)

## 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](mailto: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](mailto:ESRNZ-unsubscribe@yahoogroups.com) .

### Web sites of interest

- INES Web Site [www.inesglobal.com](http://www.inesglobal.com)
- RedR New Zealand [www.redrnz.org.nz](http://www.redrnz.org.nz)
- Water for Survival [www.oxfam.org.nz](http://www.oxfam.org.nz)
- Sustainable Energy Forum [www.sef.org.nz](http://www.sef.org.nz)
- Campaign against Cluster Munitions [www.stopclustermunitions.org](http://www.stopclustermunitions.org)
- Halliburton information [www.halliburtonwatch.org](http://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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