



Thought Leadership Workshop Four Sustainability: the climate change imperative



NZTE's 2008 / 2009 Sustainability Thought Leadership series was drawn to a close in June 2009, with the final event focusing on *The climate change imperative* for businesses to address sustainability. NZTE was privileged to host Dr. John Llewellyn as keynote speaker¹, an eminent global economist and author of Lehman Bank's ground-breaking reports on *The Business of Climate Change*. The fourth workshop was facilitated by series **facilitator Dr. Mark Wade**, who was able to provide an overview of the key learnings from the previous three workshops as well as engaging Dr. Llewellyn in a discussion on the findings from his numerous conversations with FTSE 500 CEOs around sustainability.

As the critical driving force of sustainability, it is vital to understand and address climate change. While other elements of sustainability can prompt emotive responses – such as food miles or local sourcing – climate change is, to a large extent, the primary impetus behind legislative and regulatory frameworks. As such, even if companies and individuals won't feel the physical effects of climate change for some years to come, the **market reality and the legislative framework is taking this as a given**. And in practical terms, these policies are **bringing the effects of climate change on fast forward to the present**, meaning it is simply a market reality companies need to address.

In providing the context of how climate change and sustainability are interrelated, Dr. Wade commented that, "The world is on the cusp of a new paradigm to a low-carbon economy, which will have profound implications for us all as individuals and of course as businesses. New Zealand companies are a long way from home and (the European) market and the regulatory framework is fast becoming highly sensitised to these issues." As competition wises up to this, New Zealand companies will need to be in a position to learn and adapt, which will be made possible by equipping themselves early on with the necessary facts, such as carbon footprints and lifecycle analyses in order to avoid a gradual erosion of competitiveness in the market.

To begin a more in-depth analysis of climate change, **Dr. John Llewellyn** provided the clarification that he is **not a 'Green', but an economist** – a background which ensures his approach to sustainability is grounded in the language of business. He also explained that in his experience of talking to executive-level staff in global corporations, he found almost immediately that it was necessary to ground discussions about sustainability in the credibility of climate change science, as they would inevitably return to this otherwise.

*Once an analysis of the science is convincing,
it is possible to understand the economic consequences,
the implications for policy,
and ultimately, the imperatives for companies to take action.*

It was this framework that Dr. Llewellyn used to urge New Zealand companies to plan for and adapt to the changed business environment that climate change and sustainability are inevitably bringing – arguing that **understanding these issues will be central to any successful strategy for international competitiveness**.

¹ A globally respected economist, Dr. Llewellyn has had an impressive career spanning academics and research; international forecasting, analysis and policy advice with the OECD; Chief Global Economist and Policy Advisor with Lehman Brothers and most recently, independent advisor to Nomura Bank and HM Treasury UK. Having directed two studies at Lehman Brother's – *The Business of Climate Change I and II* – he has a unique perspective on the science, economics and business challenges and opportunities behind sustainability.



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Science recap

Dr. Llewellyn provided a basic framework for understanding the significance of greenhouse gases (GHGs) and how they relate to climate change. In explaining that GHGs, such as CO₂ and methane, have an interesting and important property of allowing the sun's rays to pass more or less straight through them, he detailed that they thereby warm the Earth and at the same time, restrict the (reverse) outflow of Earth's heat to the (cold) outer space. **The greater the GHG concentration, the more the earth is restrained from cooling**, and as such, each doubling of GHG concentration roughly raises Earth's mean temperature by around 3°C.

Historically, at the start of the industrial revolution the overall **concentration of the six principal (Kyoto) GHGs was about 280 ppmv CO_{2e}** (parts per million by volume carbon dioxide equivalents). **Today**, due largely to human emissions, the figure is around **385 ppmv**. And, additionally, Earth's absorptive capacity has been reduced in a large part because of deforestation. Dr. Llewellyn noted that **'business as usual'** projections put GHG concentration by **2050 at around 580 – 630 ppmv CO_{2e}** and at 800 – 900 ppmv CO_{2e} by 2100.

Dr. Llewellyn said the implications for associated temperature change suggest that average temperatures will rise between 2 and 6 ½ degrees by the end of this century. Alternatively, the outlook can be expressed in terms of probabilities, much like the probability of any business risk would be assessed: **a 500 ppmv CO_{2e} concentration, for example, implies a 96% chance of temperatures rising by 2°C**; a 44% chance of a 3° rise; an 11% chance of 4°; or a 3% chance of 5° (with increases being greater as you move away from the equator towards the poles).

In terms of overall targets, scientists judge that to keep risk at acceptable levels, we need to aim at stabilising GHG concentrations at under 500 ppmv CO_{2e} (in other words, limiting the increase to 115 ppmv CO_{2e} – taking the 500 target minus present figure of 385) by 2050. Failure to achieve this would, Dr. Llewellyn considers, produce consequences so large that they could fundamentally change life as we know it. Dr. Llewellyn convincingly presented the current situation in relation to these advisable targets: globally, total emissions are running at around 50 Gt (gigatonnes). Given the world's current population of around 6.7 billion, this means **current emissions stand at roughly 7 – 7.5 tonnes CO_{2e} per person**. With population predictions estimating the world's population to be around 9 billion by 2050, **the 500 ppmv CO_{2e} target implies a reduction of emissions to around 2 tonnes per person per year** by the same date.

Technology recap

This is no doubt a challenging target, given that emissions are currently running at an annual rate of over 20 tonnes per person in the US, Canada and Australia; at 9 – 12 tonnes in New Zealand and Europe; and over 5 tonnes in China. However, Dr. Llewellyn went on to emphasise that a key point to note here is that **not all GHG reduction costs money, in fact some saves it**. According to surveys and calculations by McKinseys, there is a substantial proportion – perhaps **between ¼ and ⅓** – of the GHG reductions advised by scientists that **can be achieved with known technology, and at negative cost**. In other words, a number of new technologies save so much on other inputs that they pay, or more than pay, for themselves. This said, it is also necessary to manage the other ⅔ of the needed reduction in GHG emissions, which is where the economics and policies associated with climate change come in.



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Economics recap

In terms of addressing the economics of climate change, Dr. Llewellyn argued that a key concept is to understand why people pollute. One important element in the answer is that until now polluters haven't had to pay for the damage they cause – society has paid instead. In economists' parlance, these **emissions are an 'externality'** and **reducing them requires that they be 'internalised'**. In the policy parlance largely developed by the OECD, and now employed worldwide, this is the '**Polluter Pays Principle**'.

To charge the polluter a correct and fair amount, it is necessary to know the value of the damage caused by each tonne of GHG emitted. Essentially, this involves assessing the costs associated with each of the effects those gases bring. This would include calculations such as working out the temperature increase resulting from the additional amount of GHG in the atmosphere, the climate consequences and costs of the resulting damage from rising sea levels, damage to buildings from stronger winds, flood damage from stronger rainfall, diminution of water supplies or changes in agricultural productivity etc. As such, estimates for the social costs of carbon are unavoidably uncertain. However, Dr. Llewellyn maintains that after a survey of all the economic estimates to date it is practical to work with round figures of **US \$50 per tonne of carbon at present, rising to between \$80 and \$100 by 2050.**

Policy recap

There are essentially two rational types of policy to reduce GHG emissions – a tax (for the same amount as the social cost of carbon), or regulations that achieve the same quantitative result. Dr. Llewellyn suggests that the sum of these **implications is a fundamental transformation of the structure of demand and production** in the world's economies, probably considerably greater than that being experienced by the 'transition economies' of Central and Eastern Europe moving to a market-based economy, and **comparable in magnitude to** that experienced by the industrial countries following **the Industrial Revolution**, albeit significantly faster.

While there were significant limitations to Kyoto (namely not being ratified by the US, exempting developing countries, including China and India, which already account for 1/3 of global emissions, and not including land use, especially deforestation that is responsible for around 20% of the world's growth in GHG emissions), the **political tide has turned significantly** with the election of President Obama. From experiences at the OECD, Dr. Llewellyn noted that very little happens globally if the OECD is not behind it, and conversely a great deal can happen if it is. Optimistic therefore because of this turned tide, Dr. Llewellyn argued that we are **rapidly moving into a carbon conscious and carbon driven world.**



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Implications for New Zealand – business planning

Within this context of an impending carbon constrained operating environment, Dr. Llewellyn painted a clear picture of a strategically wise – or unwise – response in terms of business planning. He suggested that as a CEO, he would not want to appear before his board saying, “I am no scientist, and I know that 11 national academies of science – including the US – have agreed that mankind is warming the earth. However, I am proposing to base my corporate strategy on the assumption that these 11 national academies of science have got it wrong, and that climate change policy will therefore be abandoned.” **Rather**, that it would be most sensible and shrewd to assume that, **on the balance of probabilities**, the scientists have got things basically right; that climate change itself will not affect companies for several decades yet, **but that publics are increasingly going to support policy to reduce GHG emissions, and that those policies bring the effects of climate change on companies forward, right up to the present** – indeed they are already doing so. In short, it is highly likely that it is going to become increasingly expensive to emit carbon and that it would be wise to incorporate the consequences of that into a corporate plan now.

Implications for New Zealand – as a trading nation

Although New Zealand will likely be relatively ‘immune’ from the most severe *direct* effects of climate change, it is likely to be importantly affected *indirectly* through the effects climate change will have on its main trading partners (Australia, US, China, Japan, Singapore, Northern Europe). Dr. Llewellyn maintains that as such, New Zealand’s exporting firms, and hence the New Zealand economy, stand in turn to be distinctly vulnerable. ‘Food miles’, although an economically weak concept, has an emotional persistence, particularly within the umbrella of local sourcing. And, due to the distance to market, New Zealand exports will need to be pro-actively prepared with the data to show that our goods can compete on an environmental playing field.

Implications for New Zealand – leveraging our image

On the positive side, it was noted that New Zealand has an image of environmental purity internationally, which it would be wise to both foster and ensure the continued validity of. Moreover, just as world demand is likely to move against environmentally unfriendly products, so conversely is it likely to move in favour of those perceived as environmentally friendly. While emotion still plays a large part in this dialogue, the discussion will become more scientific with the passage of time and, consequently, policy will increasingly be based on hard numbers and evidence. Successful firms, Dr. Llewellyn maintains, will understand this trend, and to take steps to get on the right side of it now – to get the figures, to know your carbon footprint and to use this as a starting point for development.