

"Five changes of paradigm for Sustainable Prosperity."

How can we speak with any certainty about our future prosperity given the swirling forces of international capital, global development, patterns of trade, shifts in geo-political power and regional conflicts? Focusing on all the really big global issues – surging growth in China and India, escalating tensions in the middle east, the spread of religious intolerance, poverty and disease in Africa, the spectre of global pandemics, and so on – can easily make one feel powerless in the face of the future.

In fact a sense of powerlessness seems to have become a characteristic of Australian political life over the last decade or so. I spent five years out of Australia at the turn of the century; when I returned I was shocked by what seemed to me to be a malaise, a collapse of confidence, a widespread acceptance that we could have little control over our own fate. We seemed as a nation to have turned away from engaging with the future – either ignoring it and clinging to images and values of some idealised past (when world events moved more slowly), or watching it unfold from the sidelines as if we had no choice but to be dragged along with the flow. I was surprised as well by strangely complacent Australia had become as its economy veered back towards its old colonial conditions, dependent on the export of raw materials, for processing – value-adding – by others. Except for the substantial growth in services, particularly the export of education, we seemed to be content to return to the role of 'Australia as a farm and mine for the world'.

I am pleased that now there seems to be a change in the cultural mood in Australia, a re-growth of confidence and determination to actively engage with the project of shaping our future. "Future Melbourne", in the way that it is being framed and executed, is evidence of this. Embarking on a visionary project to define the character and business and prosperity of Melbourne as it evolves over the next 15-20 years, and to do so via wide consultation with its communities (including the University), reflects a new spirit which is both positive and encouraging.

So, for me, we should we start a dialogue on sustainable prosperity by noting that our future will depend on our ability to nurture that re-emerging spirit, to identify where it is strongest and help the confidence to spread. Thus it is symbolically important that this conversation takes place in this Bio21 building – medial and bio-research is one critical domain that has never lost confidence in our ability to contribute globally, well beyond our size as a scientific community.

Undoubtedly the exploration of Creative Melbourne as part of this program will likewise tap into a confidence and a creativity that has not been greatly dimmed by the dampened spirit of the last decade. We need to be writing new literature, projecting new images, re-envisioning our lives and re-inventing our future, with different concepts of prosperity.

Sustainable Prosperity – Sustainable Futures – Sustainable Melbourne.

Sustainable prosperity in Future Melbourne will be shaped by our response to another global issue which was not in my initial list, an issue that poses the greatest single challenge for our resurgent cultural mood. The challenge, which seems to confront us suddenly, is essentially of a different character to all the rest, being fundamentally, universally, global, posing the same challenge for all markets, regions, nations and economies:

how to shape development – business, economy, production, consumption, lifestyles – to deal with climate change (keeping global warming under 2 degrees and adjusting to an inevitable rise in temperature).

This issue of climate change is of a different character because it is about the physics of our world rather than the dynamics of human and social relations; it is about the functioning of the natural systems of the world in which we live (and on which we depend), rather than the way we construct our economic, political, cultural or religious existence within that world.

Focusing on how we respond to climate change points to *six changes of paradigm for our future prosperity*. The first two concern *innovation*.

Prosperity from Eco-Innovation.

The implications of climate change are so great (and community awareness so high) that it is already creating an industry of sensationalism as the media and interest groups try to stake out territory. There are conspiracy theorists that project the idea as an organised program for genocide and global domination; huge corporate investments are

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still being made to stimulate confusion, to challenge the science, to protect the power and capital that has derived from the past exploitation of (cheap) fossil fuels.

It is in that context that we are hearing from self-proclaimed 'climate realists' that Australia has to find a way to respond to climate change that does not affect our economy. That is a dangerously outdated way of responding to the issue; it has echoes of earlier justifications for complacency in relation to environmental challenges- 'conservation or progress', the 'environment or development'. What we have learnt from the last thirty years of action on environmental issues (for example with CFCs and the ozone hole) is that prosperity comes from finding a way to have both development *and* environment. *Our choice is not 'lowering carbon OR a thriving economy' - low carbon is the future economy.*

For almost a decade major international agencies, industry organisations and many OECD countries have been talking about that new low-carbon economy as possibly the greatest industrial revolution in human history. That language is also quietly evident (belatedly) in business discourse in Australia and in state government policies and agencies. Our future prosperity will depend on how fast we can embrace the reality of that revolution and become part of the future economy. The Sterne report confirmed what many smaller and less comprehensive reports had already said, we have only a short time to act if we are to avoid the devastating economic effects of climate change.

So, the first paradigm change is that we should:

1. Embrace the revolution: focus creativity, invention and innovation towards a low-carbon, low water economy.

Our federal government and our ultra-conservative newspapers see climate change 'radicals' everywhere. A 'radical' is anyone, or any organisation, that argues for setting long-term targets for CO2 reduction, particularly those based on the best scientific modelling of what is required to avoid catastrophic warming - a 60%-80% reduction in CO2 production (or carbon based energy) by 2050. Apparently the dangerously radical nature of such propositions is the idea of advocating targets without knowing how to realise them. Yet, radicals seem to have taken over so many countries and economies - the UK, Germany, California, Japan, NZ, most of Scandinavia and so on - as well as many global businesses, which have committed to long term targets. The city of Melbourne is a 'radical' with its carbon targets. Sustainability Victoria is adopting seriously 'radical' targets as an organisation. It is ironical in the extreme that one major newspaper that is so vigilant in hunting down and exposing climate radicals is owned by a global company that is publicly committed to reducing its net CO2 emissions to zero (100%) by 2010. (Strangely there are no editorials denouncing Rupert Murdoch as a climate change radical.)

Does News Limited know how it will become carbon neutral by 2010? Probably not. There is an increasing list of global companies that have made the same commitment and there is already enough experience from companies that are well on the way, like the bank HSBC, to suggest that achieving such goals requires serious investment in time (and resources) and significant business restructuring. HSBC spokespeople say that it did not know how it would achieve its goal when it made its decision. Making such commitments is not just about reputation. Setting long term targets for change, for the performance of products, or services, or productivity, or efficiency, is a proven way of driving innovation and shaping new markets. Innovative businesses know this and build their research and developments strategies around the idea - they call these 'stretch-targets'.

So the second paradigm change is a corollary to the first:

2. Embrace the idea of big challenges, audacious goals, visionary targets.

Such a cultural orientation is necessary in order to inspire people, to stimulate creativity, commitment, productivity and, most importantly, hope in the face of challenge. Melbourne City Council is already working within that framework and not just in relation to its carbon neutral plan. Look at its stretch target for water use in parks and gardens and street plantations; can it achieve its stated goal of zero net potable-quality water use in that area in three years? Will they be able to find 1000 mega litres of water from other sources? Can they reduce the current consumption figure by more than 20%? What will it mean to re-envision Melbourne as a water catchment? I've now met many people who have been drawn into that expedition into the unknown, people who are challenged and greatly stimulated by the prospect of finding solutions to achieve these goals. This is an example of setting audacious goals to drive creativity and invention and it will produce new solutions essential to our economic, social and environmental prosperity.

Beyond 'environmental technology'.

So, if the first two keys are about stimulating action, what can we say about the direction or the desired outcomes of such action? What do we know, what can we say about the *shape* of a sustainable future, about an economy that will result from dealing with climate change - both in the sense of adapting to, or living with, its effects, as well as acting to reduce its causes? Here I think a number of things that are becoming very clear. The first is about *technological change*.

When we talk of innovation we generally think 'technology'; in the context of climate change we expect 'innovation' to deliver important new technologies - new cheap solar cells, possibly new ultra-efficient motors or light sources (like

LED's), new bio-fuels and so on. We hope to see new disruptive technologies, new technical capacities that transform and re-shape markets for a low carbon, low water future.

Some complacency in the face of climate change reflects a belief that new super technology will fix the problem. There are proposals to filter solar radiation at the earth's surface by generating clouds from ocean trawling mist machines, or spreading floating filter-nets in space. These are like other schemes for the burying of vast amounts CO₂, or designing and building 10,000 cheap and safe nuclear power plants (25 in Australia). It is easy for technological crutches support a delusional form of techno-complacency.

This 'big techno-fix' perspective can easily generate another kind of pessimism about the contribution that a small country such as Australia can make to the resolution of this problem, given our tiny economy. True, we seem to have been able to make a significant contribution in the bio-medical sciences and technologies, but we can't hope to compete in too many areas of technology against the global giants. This kind of thinking seems to permeate much of the recent political debate on climate change in Australia. Our economy depends on the old technology of fossil fuels and the only contribution we may be able to make is to technological change is to make some small contribution to improving the efficiency of burning coal. The real low carbon technologies of the future will come from 'overseas'.

Over the last few weeks sections of the report of the Prime Ministers task force on carbon-trading have been selectively and systematically misquoted by various politicians. They claim that the report shows that to achieve targets for reduction of 50% CO₂ by 2050 in Australia would have to take all cars off the roads and generate all electricity from nuclear power. The selective misrepresentation comes from omitting a crucial qualification in the report's statement – *barring any significant technological shifts in the economy...* (The report is just making the point that dealing with climate change is about transforming the economy.) Such selective misquoting may not just reflect an intention to scare the community into accepting that we are compelled to continue to live in a high-carbon future. It is probably a deeper reflection of a belief that any new technological shifts in the economy will come from elsewhere and end up in the import side of our balance of payments.

The critical point however is that 'significant technological shifts' includes big new technologies *as well as* a myriad of smaller things that can transform the efficiencies of use of energy (or water). Increasing 'end-use' energy efficiency is almost universally accepted as the lowest cost path to reducing CO₂. This path incorporates social and organisational innovation as well as technical - changes in the *organisation* of systems of production and consumption, changes in urban infrastructure, in life-styles, behaviour and values.

As many other countries understand, significant changes in the carbon intensity of the economy can come from the re-configuration of current technology to create new systems, and from finding new applications of existing technologies. Many new solutions, new inventions and innovation will appear as *services* rather than products; the contribution of the service sector to our prosperity will grow as we develop solutions to living within our environmental limits. Such endeavours require creativity, ingenuity and vision but can be achieved with lower capital investment and even in low population markets.

So the next paradigm change can be described as:

3. Don't wait for big technology – focus on new uses of existing technology, smart outcomes, new solutions, enabling services.

Diversity, resilience and localised solutions.

Given the rate at which the new low-carbon revolution will proceed, our future prosperity will depend on developing strategies and policies which support *experimentation* and the rapid generation of a *diversity* of innovative new solutions, new services, new products and new life-styles. Instead of only focusing – as we do traditionally – on large scale projects, the urgent need to stimulate diversity suggests that it makes sense to support smaller, localised experimentation and development, responding to well understood, socially and culturally important local conditions. Smaller-scale, locally-relevant solutions require less investment, can better harness creativity and experimentation, are more immediately relevant to the community and have less impact if they fail.

Any innovative solutions that are successful at a local level can be replicated elsewhere or scaled up if they seem relevant. Such an approach is evident in the policy frameworks of a number of countries where transitioning to a sustainable future is viewed almost as an 'evolutionary' strategy – stimulate a diversity of new innovations and 'select' the 'best fitted' to multiply. There is a great focus of interest on transformations at the level of communities, towns and cities; this is where experimentation is greatest, where the spirit of engagement is growing. Models for new ways of living, new services and businesses, at the level of towns and communities, inspire others, give hope and deliver real gains in local prosperity².

² You can follow these developments on the internet at our new international site: www.SustainableCitiesNet.com and for Melbourne at : www.SustainableMelbourne.com; or visions of Melbourne in 25 years, look at "M2032" at www.EcolInnovationLab.com

So the next paradigm change is:

4. It is good to have a 'Melbourne-based Solutions' – to encourage a diversity of local solutions relevant to the specific context of Melbourne's sustainability challenges.

Finally, the last and most significant paradigm shift is related to designing secure, resilient systems. Climate change and severe weather events will force us to change the way that we think about the organisation of all the complex systems on which our lives depend.

The challenge of climate change is in its effects and in the pace and scale of change, and that's where the real uncertainties still lie. Projections of change, temperatures, sea-level rise, rainfall patterns – and all the consequent impacts – are averages from a lot of modelling that have big uncertainties; the impacts could be less than projected or far worse. About the only thing that seems certain is that we can expect increasing instability, rapid changes in the frequency of significant weather events. Concern about disruption of existing infrastructure, existing systems of production and distribution of goods, is growing. Expect a lot more talk about water security, energy security, food security.

We need to design new systems of production and consumption that are resilient, adaptable in the context of change, robust under physical challenge. The design directions are already clear; they are re-enforced by the huge success of a system internationally developed to be robust against all kinds of attack – email and the internet. The internet is a model of a distributed system – localised production with networked distribution. The same model is appearing in energy. A resilient, secure electricity system consists of many diverse localised production units feeding into the grid. A pattern of grid-connected distributed electricity generation can be more efficient and effective; it supports the utilisation of diverse energy sources where they exist (solar, wind, geothermal, tidal, biomass, etc); it reduces distribution losses and provides greater security in the face of threats to infrastructure. If an 'event' takes out some wind generators it has little effect on the total generation system (in contrast to the effects of disruption of large production units). That is why so many countries are planning for a massive increase in distributed 'micro-generation'.

The same shift of thinking is evident in water – water is a distributed resource like energy and the old pattern of catching water in large dams and distributing it to users is giving way to a mixed system of keeping water where it falls and using it locally to supplement reticulated supply. This is what 'Melbourne as Catchment' is about; this is the basis of water sensitive design.

So the final change of paradigm is that:

- **Shift thinking from big scale centralised systems to 'distributed' models – networked, localised production and consumption.**

Making it happen

So how might those changes be manifested in Melbourne? What can we do and what could we see in a future sustainably prosperous Melbourne? In the spirit of engagement, creativity and innovation, answers to these questions need to come from everyone excited by the prospect of a better sustainable future. I've tried the ideas out on a few people and here are some examples of what could happen – as a starting point for generating many more:

- *Melbourne could aim to be the city with the highest proportion of carbon-neutral businesses in the world.*
- *Melbourne could define and develop the idea of 'water-neutral' businesses.*
- *The successful icon of innovation in green buildings - Council House 2 - could be supplanted by the (more important) innovative re-development of Council House 1 (as a model for the greatest challenge facing us in that area – refurbishment of our existing building stock).*
- *Develop a bike-city of the twenty-first century (beyond the models of twentieth century European cities)*
- *Greening the roofs of buildings for sky-level parks.*
- *Melbourne could become a world centre for environmental and eco-innovation education, at all levels; bringing the best of its two 'down-town' universities and business schools in programs to increase eco-innovation capacity*
- *Melbourne could set up a 'green entrepreneurs' fund to support and encourage young entrepreneurs with new innovative ideas and businesses.*

In the spirit of new confidence and creativity, the Future Melbourne process should be able to add to this list. Our future prosperity may depend on such engagement.

