

## THE ECONOMIC CASE FOR CHANGE

*Discussion Starter by Bob Welsh*

### Background/Context

Greenhouse gases (GHG) accumulating in the troposphere regulate the earth's temperature balance. The higher the concentration of GHG the higher the average temperatures and vice versa.

Over the past 600,000 years there have been variations in the concentration of GHG in the troposphere. These changes are believed to be due to natural occurring events including solar activity and changes in the earth's axis and rotation around the sun.

Analysis of deep core ice samples indicate that during this period the variation in GHG were within the range 180ppm to 298ppm CO<sub>2</sub>e. Average temperature changes associated with these variations are estimated to be in the vicinity of +/- 5°C. These average temperature changes albeit small in absolute terms have brought physical consequences for the planet including ice ages.

Since 1750 and the emergence of the modern corporation which heralded rapid economic growth, changes in concentration of GHG in the earth's atmosphere have been far more dramatic with a rise in CO<sub>2</sub>e to around 379ppm by 2005. The associated increase in average temperature has been in the order of 0.7°C to 0.8°C.

The scientific consensus is that the increase in GHG is human induced primarily through the burning of fossil fuels (for electricity production, space heating and transport) and massive landscape change to the meet the needs of the world's population which has expanded sixfold since the start of the Industrial Revolution 250 years ago.

The physical consequences of this degree of warming are already being felt around the globe and in Victoria with reduced water availability for agriculture and population centres, biodiversity loss and ecosystems stress, rising intensity of storms, heat waves, bush fires, droughts and floods.

Continuation of economic development on a "business as usual" basis will see a further sustained increase in GHG concentration in the troposphere according to the Intergovernmental Panel on Climate Change (IPCC) in their Fourth Assessment Report (2007).

The IPCC compiled a range of possible scenarios for economic growth and related average temperature increases for the remainder of this century. Using a robust level of "business as usual" development (3% annual global economic growth with high dependency on fossil fuel for energy and no effective emissions mitigation) the IPCC models show a possible range of average temperature increase of 3.5°C to 5.5°C within one standard deviation. Carbon cycle feedbacks could send this upper range to 6.1°C with potential catastrophic physical consequences for ecosystem services including climate regulation and provisioning of food, water and fibre.

The Garnaut Climate Change Review interim report (February 2008) note that this scenario is already being exceeded due to the unexpectedly high growth in the world economy since 2000 and the high energy intensity of that growth sourced from fossil fuels.

Faced with a potential average temperature increase of 5.5°C or more by 2100 the economic case for change is relatively straightforward. There is no business case for destroying the planet for human habitation.

The Stern Review on the economics of climate change published in the UK in October 2006 was the first comprehensive examination of the economic challenges presented by rising global average temperatures for the UK and the world and how those challenges could be met.

The Stern Review inferred that the failure of the market to internalise the environmental damage costs to the troposphere of economic development has meant that the capacity of the planet's ecosystems to regulate the climate is being severely impaired.

This has not only greatly increased risks for continuing economic growth but also for the very existence of all species on the planet.

The Stern Review calculated the economic damages from "business as usual" to be equivalent to at least 5% and up to 20% of global consumption (GDP) per year now and forever. Alternatively the costs of taking action over the next 10-20 years to reduce emissions and keep temperature increases below 3°C (albeit a temperature rise not without significant risk to quality of life) are around 1% of consumption per year.

The economic upside of taking action now is the massive scale of investment required to transform the global economy including Australia and Victoria into carbon constrained economies and to build resilience and flexibility to the physical consequences of warming.

## **Implications for Victoria**

It is in Victoria's interest that the global community agree with the Stern Review's conclusions on the economic benefits of adopting ambitious emissions reduction targets and following up with massive investments to transform economies.

Victoria like the rest of Australia is perhaps more exposed to the physical consequences of increasing average temperatures than other developed economies. Average temperatures experienced by Victoria are already warm to hot, the agricultural sector is sensitive to rainfall variability, particularly poor autumn rainfall and the risk of bush fires to life and infrastructure is omnipresent.

Accordingly Victoria will benefit from the global community adopting ambitious GHG reduction targets.

Nevertheless there will be a cost to Victoria through recognition of costs in the prices of goods and services that were previously externalised. This is particularly the case with power generation and space heating fuelled from brown coal and gas that under a foreshadowed emissions trading scheme, will include a price of carbon.

## Options and possible ways forward

Victoria could consider an integrated climate management approach, which for investment purposes looks separately at climate mitigation (tackling the causes of climate change), climate adaptation (tackling the impacts of climate change) and climate response (responding to climate change).

The three parts of this proposed integrated climate management approach will require massive investment.

### Climate mitigation

The Federal Government has announced its intention to implement an emissions trading scheme that will establish a rising carbon price signal linked to a long-term emissions target. This initiative is a 'market pull' policy for low emissions technology deployment.

What is also required is "market push" policies developed by governments that incentivise a step-change in transformational low emissions energy technology development.

Technology options requiring incentives and risk sharing with government under market push policies include:-

- Energy efficiency improvements
- Power generation from sources that do not burn fossil fuels
- Carbon capture and storage from fossil-fuel generation

In addition, technology options increasing natural carbon dioxide absorption through revegetation, although unlikely to make a marked difference in mitigation, has considerable benefits in restoring the effective functioning of ecosystems if government establishes effective markets for ecosystem services.

### Climate adaptation

Options for consideration include investments in early warning systems, implementation of new building standards and government encouragement of development of new construction materials that will limit the negative impacts of severe changes to weather patterns.

Other investment programs are required for protection to infrastructure particularly water, transport and energy distribution systems.

The negative impact of severe weather events and continual warming on Victoria's ecosystems require alignment of planning schemes with the need for land-use redesign on a landscape scale and development of new water products including environmental flows.

Victoria needs to attract significant investment in land-use redesign, revegetation of up to 20% of the State and water use efficiency.

## Climate response

Opportunities for development of new skills, innovation and new industries to help with climate response can be pursued.

Options include developments in health services, infrastructure maintenance, waste management services, construction and building materials, machinery and equipment.

## Critical questions for Victoria

- (1) Can the impact of the higher costs of electricity production due to inclusion of a price on carbon be minimised by comprehensive efficiency improvements in the residential, commercial, industrial and agricultural sectors? If so is there a role for government/private sector partnerships?
- (2) Should Victoria develop its own Low Emissions Technology Strategy providing support to new “step-change” low emissions technologies to successfully traverse the high risk R&D/demonstration stage of technology development through to full commercialisation?
- (3) Should Victoria independently or in co-operation with other States accelerate the market share gains for hybrid vehicles through fuel economy standards and stricter limits on greenhouse gas emissions?
- (4) Should Victoria fast track the development of markets for ecosystem services including carbon sequestration?

**By Bob Welsh**  
**April 2008**

*This discussion starter has been prepared by Bob Welsh to stimulate ideas and debate at the Victorian Climate Change Summit. It is not a statement or policy paper by the Victorian Government.*