

TRANTER RESPONSE

The fact that this Inquiry has been set up so soon after the Government's White Paper on Carbon Pollution Reduction suggests that Parliament is at odds about the best way to proceed. Taken in context with the recent collapse of the stock market, the time has come to reconsider old certainties such as the relative merits of growth versus the steady-state. Herman Daly, the World Bank's senior environmental economist from 1994 to 1998 asks the question: "What is growth? Is it a temporary process to arrive at a state we will want to maintain? Or is growth a process which is itself desirable and is supposed to go on forever?"

There is a law in nature ("The Law of the Minimum"), which states that production is governed by the resource in shortest supply. This applies in equal measure to such fields of study as ecology, economics and agriculture. Crop production, for example, is governed by such factors as land availability, soil, climate, fertility, rainfall, and the availability of seed and fertiliser, as well as factors such as machinery, transport, labour, capital, innovation and demand. However, economics tends to ignore natural limits to growth by "externalising" them, implicitly acknowledging the limitations of economics itself as a useful social tool. Whereas the population of the world was once small relative to the natural resources on which it depended, today the ratio has reversed. Nearly half the earth's photosynthetic production, for example, is now being used, either directly or indirectly, to feed human beings with the result that natural resources are becoming scarce. If that were not so, there would not be so much starvation in the world.

What has that got to do with Australia and, in particular, to the current dilemma about how this country should reduce its fossil fuel emissions? The answer is that emissions end up in the atmosphere and ocean, each with a limited capacity to process carbon dioxide waste without overheating the global greenhouse. Carbon dioxide spreads throughout the global atmosphere in a matter of weeks, influencing rich and poor alike; there is only one atmosphere. Some nations emit more than others, some per capita; some have better technology; some are less affluent; and some have become affluent at the expense of others. So it became necessary at Kyoto to adopt an agreed "datum year" as the target for national emission reduction aspirations.

The agreed year was 1990, its purpose being to level the playing field by taking account of different stages of national development. However there was no evidence that the 1990 atmosphere had been able to process all the fossil fuel emissions it was receiving. That would have been most unlikely because there are some significant bottlenecks in the carbon dioxide cycle. The main carbon dioxide reservoirs in the world are the ocean, the soil, the vegetation and the atmosphere, the ocean containing more carbon dioxide (in dissolved form) than all the other reservoirs put together.

The ocean's capacity to accept carbon dioxide from the atmosphere is limited by several bottlenecks: first is the limited solubility of carbon dioxide gas in sea water; second is the limited capacity of the surface layer of warm oceans to mix with subsurface layers, separated as they are by a temperature barrier ("thermocline"); third is the limited capacity of subsurface waters to mix with the ocean deeps, except in the North Atlantic and Antarctic. Taken together, those three factors combine to limit the overall capacity of the ocean to accept excess carbon dioxide from the atmosphere. Just as rains increase river flow causing river levels to rise, so fossil fuel emissions increase the carbon dioxide level of the atmosphere causing global temperatures to rise. Furthermore, as seas warm, the temperature barrier between surface and subsurface seas

becomes stronger and dissolved carbon dioxide comes out of solution, escaping from the sea into the atmosphere and overheating the global greenhouse. That's the crux of the problem.

The challenge faced by this Inquiry is to identify a formula for reducing annual fossil fuel emissions to the inherent carrying capacity of the atmosphere and ocean, rather than to an arbitrary 1990 level. Science can readily estimate how much carbon dioxide the atmosphere can take before it overheats. The task of economics is to identify how that goal could be achieved. The first pre-requisite is that economics should seek to serve the needs of society, rather than the reverse; the second is that growth and development, which for far too long have been assumed to be much the same, should be decoupled. As Daly says, "Growth is more and more of the same stuff; development is the same amount of better stuff."

Perhaps the time has come to consider the merit of steady-state economics as a means of stabilising both the global climate and the global stock market?

David Tranter D.Sc., OAM