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GARNAUT REVIEW RESPONSE.

TRANSPORT, PLANNING & BUILT ENVIRONMENT.

The following submission concentrates on the above areas. The submitter is a practising Civil Engineer/Town Planner/Building Surveyor, operating a six person consultancy practice in the Melbourne Metropolitan area.

I initially address the questions suggested for consideration, then provide additional views on a number of related issues that I believe need consideration.

Questions posed.

What are the key barriers to cost-effective low emission opportunities in the building sector?

What policies could be used to address the low uptake of energy efficiency opportunities, given that many of these opportunities already provide financial benefits for firms and households?

What policies would be appropriate to overcome barriers to low emissions opportunities in the building sector, such as split incentives and information gaps?

Are additional policies necessary to address barriers to low emission opportunities in existing buildings?

What are the key barriers to cost-effective low emission opportunities in the building sector?

One key barrier to cost effective low emission opportunities is that much of the market is relatively uninformed and driven more by current fashions and often misleading advertising. For example, advertising halogen lamps as low voltage which many misunderstand to mean low energy when the reverse is the case. An increased requirement for basic understandable "green" labelling is essential.

Another key barrier is the reluctance of many in the industry to shift from past practices, as change carries a risk. This is particularly so in the residential market.

A combination of educational advertising/labelling and improved information sessions with building industry groups will help. This needs to be driven by a clear message on changes underway that make it important for the industry to plan ahead incorporate low emissions technologies in all aspects.

What policies could be used to address the low uptake of energy efficiency opportunities, given that many of these opportunities already provide financial benefits for firms and households?

The main policy has to be directed at the bottom line - hip pocket. This has to be supplemented by a feel good campaign backed by sound information and media support. For some energy efficiency measures with a high capital cost but a reasonable payback period (< 5 years), such as solar HWS government incentives/regulation can assist. In many cases

with new houses, the capital cost and loan repayment is the only item considered by the purchasers. Encouraging lenders to recognise (as some already do), the merits of a new house having lower annual energy costs as a factor that enables an increased level of lending.

Alternatively, the most effective approach outside the transport sector could be to largely drive change through the building sector by regulation. This should be assisted by Government support directed at education about why we need to move to lower emission products and providing examples of the benefits.

What policies would be appropriate to overcome barriers to low emissions opportunities in the building sector, such as split incentives and information gaps?

Split incentives.

These constitute a major distortion and impediment to efficient energy use in our offices. Our landlord has invested in larger air conditioners as a simple fix rather than retro-fitting options which may have cost less but were more complex to evaluate.

The introduction of variable hourly tariff rates for electrical energy consumption for all consumers, coupled with interval metering with consumption displays, would have a significant impact on energy consumption patterns and provide substantial incentive for alterations to behaviour patterns. It should create market pressure on landlords as tenants will become more sensitive to the relationship of energy costs in different types of buildings, especially at times of high demand for air conditioning. This would have other material benefits in providing incentives for retro-fitting of existing buildings and providing a much clearer signal to existing and potential landlords of the benefit of energy efficient buildings.

The move towards interval metering using variable rates to reflect peak demand costs should be supported.

Information Barriers and Risk.

For many the old way of doing business is preferred to minor savings and having to learn about change. There is considerable information available on how to reduce emissions, but in a busy environment, most want to get on with the job and are reluctant to change from business as usual. The most effective measure to improve performance of new buildings is likely to be regulation which force change rather than leaving it to the market.

For new buildings, there must be a steadily increased emphasis to ensure they are required to achieve a higher energy efficiency in both embodied energy and energy consumption.

The lack of information on the energy performance of existing buildings needs to be addressed to provide a level playing field in the market place. All buildings (with a few exceptions where heating and cooling is not relevant), should be required to provide a star rating or similar report by an independent certifier prior to sale.

We now have a 1 in 4 risk of catastrophic climate change even with action keeping emissions to about 450 ppm. CO₂ (e), according to some sources (2). This risk is far, far above levels of failure that are typically acceptable to the community and as such any action should be taken on the basis that serious and urgent action is required by all levels of government and community.

Are additional policies necessary to address barriers to low emission opportunities in existing buildings?

See above comments - the market, with appropriate government regulation, which is being introduced, will encourage retrofitting for business buildings. For existing residential buildings, the most significant short term impacts can be achieved by mandating solar HWS replacements for existing HWS's and rolling out programs to provide low cost loans for insulation improvements.

ADDITIONAL ISSUES.

Local impacts.

Local impacts can be reduced in the more urban areas by enforcement of a relatively uniform height limit, especially in commercial areas and medium density areas. In lower density areas, overshadowing by trees can be a significant problem impacting on the solar performance of many detached dwellings. Investigation into the guarantee of a minimum solar access right needs consideration by land use planning authorities.

Access to funding (capital).

To achieve maximum emissions reductions, externalities imposed on the wider community by individual inaction on emissions savings, due to insufficient capital, needs to be dealt with by policy action. Just as there is a case for measures that penalise excessive individual emissions that create above average externalities, so there is a case for incentives to provide access to capital for cost effective retro-fitting of emission reduction measures to lower income individuals, as part of a package to offset the disproportionate increased costs imposed on lower income groups.

Consumer preferences.

While the freedom of choice has been seen by many as an unfettered right, to continue unbounded acceptance of that position in dealing with climate is untenable if a socially acceptable outcome is to be achieved. As Garret Hardin noted "Freedom in a commons brings ruin to all" (1). This is an area which requires the acceptance of the need to identify a house footprint in terms of embodied energy and an energy rating based on an average household size entitlement, to provide equity between households. Such a system would provide for an up front emissions penalty on an increasing ratio of house size above average size by habitable floor area and would be part of the building administration system. This approach is directed internalising individual decisions which impose additional costs or burdens above an acceptable average on the wider society, and cannot not be justified by some over-riding need of that individual.

Additional barrier - market profits. It is not in the interest of a power supplier to see a reduction in the amount of energy they sell, unless the carbon price is such that it becomes more profitable to enter the market to buy offsets or to invest in a lower emission technology.

Additional barrier - go for growth. A high rate of growth, whether it be population or economic growth will make it significantly harder to achieve the necessary reduction in emissions which is required for a sustainable future. The conventional paradigm of economic growth and population growth (represented by business as usual) needs to transition towards a stable population and economic development (rather than growth) in the coming decades. Failure to do so is likely to lead to increasingly difficult challenges and probable serious decline in the longer term.

Given the contribution additional infrastructure makes to emissions currently, in the order of 20-30% depending on what is counted as the source, it is inconceivable that the emission reductions which more recent evidence (2) suggests are required, can be achieved unless infrastructure growth is either reduced or made much more efficient. As much of the growth pressure for the next 2-3 decades is already in-built, this makes it more critical that we reduce our urban emissions footprint in particular and address the drivers behind it.

Urban form is an important factor in the level of emissions. The adoption of a 'traditional' neighbourhood layout with some mixed uses and a grid road network can result in a reduction in transport CO₂ emissions of up to about 60 % per dwelling (3). An increase in densities and the use of public transport, coupled with activity nodes in metropolitan areas to provide more local employment, would materially reduce emissions. This pattern is represented in plans such as Melbourne 2030, however, it is evident that the public transport infrastructure investment must match the urban expansion if emission reductions and higher densities are to be realised. To achieve such a reduction in built infrastructure emissions and those derived from the built form, consideration needs to be given to complementary measures. These measures include the phased introduction of congestion taxes in larger metropolitan areas hypothecated to offsetting actions such as public transport and bike/pedestrian improvements and support for new urban forms and related research. The implementation of higher densities and more mixed use, provide opportunities for more efficient and frequent public transport and more services within walking distance. The main problem is to achieve community acceptance of the change required, over time.

In smaller urban areas, outside metropolitan areas, the need for these actions are not likely to yield meaningful benefits as most trips are shorter and services are mostly local.

Continued urban growth is also a significant driver in emissions and the policy logic in continuing to support the drivers behind it needs review as to whether it is a sustainable policy in view of climate change and related pressures.

Equity issues.

Equity is not effectively addressed by emissions trading in that it allows the individuals who can afford to adopt lifestyles which generate a high level of emissions to lift the average reduction per year in emissions to a higher level, and effectively raise the cost burdens for all. It is very frustrating for those who are being actively reducing their personal emissions to see their actions cancelled out by the lifestyle adopted by others. This inequity would be reduced by a system of allocating individual carbon allocations, which has the advantage of a direct message to the consumer.

While individual carbon allocations have been considered (4) and appear to be attractive, and prima facie, are likely to result in a more rapid shift in individual consumer behaviour it is recognised that further work needs to be undertaken. The possibility does exist for the use of a swipe card to record a carbon tax payment for relatively simple purchases such as fuel effectively. While this may not be the most cost-effective way of sending the purchaser a signal of the implications of his or her decision, it may be psychologically more effective than an added cost to a litre of petrol with the emissions trading costs buried in the overall price..

As indicated earlier, there is a case for ensuring that those individuals who have the finances to purchase more products that result in a much higher individual carbon emission, should bear the additional cost imposed on the wider community through a higher "carbon" or progressive payment. This should apply not only to larger houses but also to other products such as larger carbon emitting transport modes, such as larger cars, most larger commercial vehicles and aircraft (at least initially in the internal market).

The general proposition that the emissions trading should be financially neutral in tax impact, as far as possible is supported.

Population issues.

The link between economic growth (not economic development) and greenhouse gas emissions appears to have been a subject for denial in the media until a call by Dr Barry Walters (5) suggesting that "every family having more than a defined number of children should be charged a carbon tax". The link with climate change is inevitably tied in with the need for transport and other energy related infrastructure including housing for more

individuals. It cannot therefore be ignored in the context of climate change and more importantly the whole question of a sustainable future. It also links to and is reinforced by the equity issues raised above.

If climate change is to be effectively addressed, the issue of population as a key driver cannot be ignored.

Just as freedom in a commons ultimately brings ruin to all, unconstrained urban development arising from population growth in an already overloaded commons (the Earth), needs to be recognised as a serious threat to achieving emissions targets. The current policy of encouraging an increased birth rate through a child bonus is a policy that beyond 2-3 children per family should be revised to a system that discourages families above 3 children.

Utility services. The provision of water, sewerage and power supply has long been dictated by a concentrated treatment /storage or generation node, servicing a large area. Consideration needs to be given to the viability of a more decentralised network system which will offer lower energy losses in transmission of these services. The most basic examples include PV systems feeding back into the electrical grid and local use of roof stormwater runoff. Other examples are community power projects such as the Hepburn Wind Farm in Victoria. These and related actions may become more viable with an emissions cost influencing decision making, providing impediments to entering the electricity market are minimised. In the interim support and investigation of increased "localisation" of these services and related options should be supported by Government.

Major transport infrastructure. The association of major new infrastructure with a potential emissions increase needs careful consideration in the medium term until some trends become clearer. In particular, the construction of urban freeways should be deferred until it is clear that there is a feasible solution to the issues of vehicle emissions, peak oil and substitutes for petrol and diesel. The fundamental problem with urban freeways, over time, is that in metropolitan areas they encourage increased trip lengths which ultimately erode their benefits. These increased trip lengths, while offering more choice of home and work location, lead to an eventual rise in emissions and can encourage lower density development. Lower density development can then work against cost effective public transport which needs to become a higher priority. Given the uncertainty around future personal mobility and the need to reduce emissions, it would be prudent to defer urban freeway extensions and accelerate and increase the density of the public transport network.

Transport Modes. The need to steadily reduce our transport emissions requires careful planning. If the 40% increase in emissions predicted for Melbourne in Sir Rod Eddingtons report (6) are replicated throughout Australia, then we are in trouble. The most obvious steps include a move to plug in cars (7) supplied from renewable power, geothermal, or perhaps "clean coal" sources. This does not resolve the massive road freight issue which may need to be addressed in the medium term through an upgraded rail freight network.

The nominated solution of more hybrid cars needs to be reviewed carefully, as the real payback period in emissions reductions can be quite high and a plug-in supply ultimately based on renewable energy may be the only viable option.

Further investigations into a more sustainable individual transport mode, based on a plug-in electric power mode or other alternatives, in conjunction with amplification of the public transport and rail freight network should be given a high priority.

International action.

The emissions from international transport modes, especially air travel, need to be brought into the emissions umbrella, as growth based on business as usual could defeat other measures to reduce emissions.

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- References.
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 - (2) (Target practice - where should we aim to prevent dangerous climate change? D Spratt; P Sutton, Nov 2007)
 - (3) Chip Kaufman, paper delivered to 2008 National Congress of the Australian Council for New Urbanism - February 2008).
 - (4) www.defra.gov.uk "A Rough Guide to Individual Carbon trading: Nov 2006.
 - (5) www.abc.net.au/worldtoday - 10-12-07.
 - (6) Melbourne Age 9-04-08, p5.
 - (7) CSIRO low emissions transport leader D Lamb Melbourne Age 9-04-08, p5.