sI have responded to the first few questions posed in the discussion paper. In general, I believe that the barriers to adaptation are largely socio-political, rather than technical. They result from reluctance on the part of citizens and their elected representatives to spend money against an uncertain future. In this, the adaptation debate has much in common with the parallel debate over mitigation.

How is effective adaptation best defined? How can it best be assessed? In other words, is the rate of adaptation 'too much' or 'not enough', 'too soon' or 'too late'? What other considerations may be relevant for maximising the net benefits to the community from adaptation?

The UNDP (2004) definition of adaptation is most appropriate, since it is high-level and does not attempt to define specific issues that will need to be addressed in any management plan. We support the PC suggestion that a 'no regrets' policy would be best - that is, one in which some certainties can be laid down, even though some actions will be seen, in the medium term, to have been overly cautious. Flexibility can be provided by periodic revision of the adaptation strategy, as events unfold. Three (or five?) years would be a suitable interval between reviews.

What kinds of adaptation to climate change (and variability) have proven most effective to date?

Climate change has not yet taken place to any marked extent, at least to the extent that impacts which might be weather-related can be ascribed to climate change. That being the case, it is difficult to know in advance which adaptations are certain to be effective. Most adaptations are in the planning stages. They include (i) proposed responses to sea-level rise or increased intensity of coastal storms, both physical barriers and planning controls on coastal development, (ii) reconsideration of insurance against the impacts of events such as floods, (iii) provision of refuges and implementation of planning controls in bushfire-prone areas, and (iv) but in much less developed way, consideration of possible changes to agricultural practice (altered crops and/or regions) due to changes in water availability and insolation.

How can uncertainty be addressed in the context of adaptation to climate change?

It would be a mistake for planners to try to eliminate uncertainty or even to lend the impression that that is the aim of adaptation planning. Australians, and people of other nations and regions, will need to be aware that uncertainty will continue and that the aim of adaptation planning is to reduce uncertainty, not to eliminate uncertainty. Getting this

message across will need repeated, skilful communication. Continued monitoring of environment is needed so as to discern the extent of climate change taking place against a background of weather-variability which is most often perceived by the public as climate change.

What is the most useful way to classify, define and identify barriers to adaptation? Are the categories set out above appropriate? Are there other types of barriers?

All of the barriers foreseeable and unforseen, could be accommodated in one or more of the four classes of barrier set out in the PC discussion paper. Albeit if at times the notions involved in the four classes will need to be stretch a bit so as to accommodate and 'unknown unknown' that emerges over time. Cultural barriers, one of the four classes, will exist at the political as well as at the personal level, as we have seen over related questions of mitigation. The adversarial nature of Australian politics, and the division of responsibilities between federal and State/Territory spheres (and even, to some extent) to municipal government, means that from time to time a measure which is optimal on economic and social grounds may be rejected for political reasons. Building community trust in expert advice will be important in surmounting such barriers.

What market failures could inhibit adaptation in any specific sector or region?

The political barriers referred to above constitute a market failure.

Are there examples of policy or regulatory barriers that could inhibit adaptation? What are these? Could the objectives of these policies or regulations be met in alternative ways that have greater benefits and/or lower costs and distortions?
What other significant barriers (for example, behavioural or organisational) might inhibit adaptation? What effects might these have on decisions about whether and how to adapt to climate change?

The need for planning to facilitate appropriate development of housing, industry and recreational facilities is referred to above. There are likely to be regulatory barriers at state/territory and municipal level, where present regulations need to be changed but change is resisted on grounds of amenity, culture or profit-seeking (development plans thwarted or curtailed).

What regulations reduce the flexibility of individuals, businesses and other organisations to adapt to the potential impacts of climate change?

This question seems to imply that Australians are eager to make adaptations to their lifestyle, accommodation, travel employment and other parts of life, but might be hindered by existing regulation that limits or prohibits the necessary actions. It seems far more likely that the need to adapt, at personal level, will not be accepted or not perceived, and that regulations driving adaptation will be seen as onerous. As mentioned above,

there will be a need to generate acceptance of expert advice and ensuing regulation. The way that climate change legislation divided the community is a warning that similar difficulties may attend adaptation planning.