Uncertainty, Risk and Insurance

Policy summary
Decisions on the most appropriate climate change policies should be proportionate to the risk posed by the impacts of climate change. The predictions of impacts, however, are fraught with significant uncertainty. Sound policy neither hides this uncertainty, pretending it doesn’t exist, nor hides behind this uncertainty, claiming that it prevents reasonable action. This calls for an approach to risk reduction rooted in the twin ideas of insurance and adaptive management.

The Setting
Climate science has been beset recently by a series of public disclosures of the contentious basis for some of the claims being made for the risk from climate change. While these disclosures clearly had a connection to groups with an agenda of discrediting the science in the run-up to the Conference of the Parties (COP15) meeting in Copenhagen in late 2009, they nonetheless point to a significant feature of science that is forgotten at times by both sides in the climate change debate: the inherent uncertainty in all knowledge, including that from science.

This uncertainty is expressed throughout the reports of the Intergovernmental Panel on Climate Change (IPCC). It is, however, often put aside when policy makers want to strengthen calls for or against what may be costly strategies for reducing the risk of climate change. Uncertainty is also chronically underestimated in even the best scientific studies, since the sources of this uncertainty are numerous, complex and involve of mixture of data, models and expert judgment. Tools needed to provide a complete picture of the uncertainty are in their early stages of development. The result is both an incomplete understanding of the significant uncertainties underlying climate change policy and an incorrect claim that this uncertainty precludes policies until it is somehow “resolved”.

The Solution
Our approach at 4CMR has been to confront this uncertainty directly through the idea of risk and the well established economic practice of buying insurance. To say there are risks from climate change doesn’t mean we know the effects, and know they will be bad. In fact, risk only exists when there is uncertainty as to how the world will play itself out. How do we deal with risk in daily life? We do it through the provision of insurance. We buy insurance on a car not because an accident is certain, but precisely because it is uncertain but one of the possibilities we face. What is the premium for that insurance? It all depends on the likelihood of the accident, which brings us back to uncertainty as the basis for both risk and insurance.
Strategies to reduce the risks of climate change must, therefore, be viewed through the same lens as we view insurance. “Pricing” this insurance through allocation of resources to either mitigate or adapt requires an ability to understand not only the possible impacts of climate change (on health, on water provision, on lost assets through coastal inundation...), but how vulnerable specific sectors are to those impacts and the likelihood of these impacts occurring in 2015, 2030 or 2100. Estimating this likelihood is the job of uncertainty analysis.

When insurance companies set premiums, however, they usually do so on the basis of historical data. These data aren’t available for climate change, since the effects are in the future. This isn’t a call for inaction, however. There remain the models of climate science, however uncertain these might be at present, which allow a peak into the future under some scenarios that are judged to be reasonable possibilities for how societies will develop. Faced with this uncertainty, uncertainty that makes the practice of insurance difficult, the path forward is one of adaptive management. We can as a society take actions today that might be desired for many other reasons. Energy efficiency improves economic performance. Solar power is a valid strategy to improve fuel security. These arguments are valid even if science is quite wrong on the risks from climate change.

Adaptive management then puts in place a system to capture data on climate change impacts as these impacts make themselves known and the science improves. That system is being created globally through scientific research groups.

Equally important is an effort to put in place a system to measure the effectiveness of technological, economic and social strategies for risk reduction, again to better inform the decisions of the future. As this systems returns more complete answers to the uncertain puzzle of climate change, the strategies of mitigation and adaptation will change and the insurance premiums paid to deal with uncertainties will change.

**Conclusion**

The answer to uncertainty in all risk-based decisions such as climate change policy is adaptive management built on a model of insurance against future risks, and premiums (costs we are willing to bear) that change as more information becomes available. The uncertainty identified by climate change “believers” and “skeptics” alike is real and to be confronted openly and honestly. It is not, however, a reason for inaction, so long as that action follows the principles of adaptive management.