Title: Climate Change – the Scientific Consensus

Recent discussion on these pages ("Manmade global warming?..." 2 Feb 2008) raises doubts about the most likely cause of ongoing global warming. Skepticism toward pronouncements by scientists (as well as those of politicians and other public officials) is healthy. Constructive criticism should however, be based on careful examination of the evidence, and not simply on impressions gained second-hand from sometimes dubious sources. As Professors and researchers at Memorial University with expertise relevant to climate change and environmental science we therefore believe it is useful to provide here our collective view as to where readers can best search for the current knowledge. We also identify some of the key points on which most scientists agree.

We all enjoy talking about the weather and basic climatology can be relatively easy to understand. Yet, the global climate system is complex with considerable inherent uncertainty. Therefore, to understand climate change we need the collective efforts of specialists from many disciplines. Because of the importance of getting it right, the UN Environment Program and the World Meteorological Organization established the Intergovernmental Panel on Climate Change (IPCC) to coordinate the scientific community and to communicate to the public the latest, thoroughly tested knowledge about climate change.

The most recent report of the IPCC (2007) is a massive, peer-reviewed, heavily-referenced work. It is the outcome of a consultative process that involved thousands of working scientists from around the world and assesses all of the mainstream research. That report and related documents are freely accessible to everyone via the IPCC website (www.ipcc.ch). The IPCC even offers a Summary for Policy Makers that provides the essentials accessible to people not interested in working through the details. This is an excellent starting point for anyone trying to make up their minds in the face of sometimes confusing and conflicting claims about climate change. This exercise is an ongoing process – new knowledge is reported in scientific journals (and widely summarized in the media) almost daily.

On the basis of this body of research there is general agreement among the scientific community that the patterns of climate change observed in the last 50 years are different from those observed over the previous 100,000 years. In particular, there is broad acceptance of the IPCC conclusion that " it is extremely likely that humans have exerted a substantial net warming influence on climate since 1750" (IPCC AR4 WG1 2.9).

With regard to how this influence has largely been exerted, there is again broad agreement. Over the past century or more, there has been a significant increase in the atmosphere of gases responsible for the "greenhouse" effect. Present day levels of carbon dioxide in the atmosphere are more than 20% greater than at any stage in the last 650,000 years. Burning of fossil fuels (by humans) is one of the principal sources of this increase.

While the detailed global patterns of climate change that are the result of global warming cannot be predicted with high levels of confidence there is yet again a consensus that these

changes will impose profound costs on the global community. These costs will arise in many ways, including flooding and loss of land due to rising sea levels, damage due to more extreme weather conditions, reduced crop yields in temperate zones, the ecological and downstream effects of melting ice in the Arctic due to increased temperatures and through changes in rainfall patterns that will increase the pressure on the already stressed supplies of freshwater.

A clear and widely accepted implication of this evidence is that we can lower these costs by reducing greenhouse gas production or by increasing the capture of these gases. Either measure will impose some costs on current industrial and household greenhouse gas producers. Such measures are also perceived by some in the energy sector as being likely to affect their long-run profitability. As occurred when scientific evidence emerged on the link between smoking and lung cancer, it is to be expected that some with vested interests will challenge the results that threaten their profitability.

It is the claims of those with vested interests rather than the evidence of the scientific community that should be of concern to the public. In the climate change debate not only are some making misleading challenges to the accepted scientific evidence but they also seek to generate fear with exaggerated claims of the costs of actions to reduce manmade global warming. As the recent report by Sir Nicholas Stern (former Chief Economist of the World Bank and Head of the UK Government Economic Service) warned, we may end up penny-wise and pound-foolish – the costs of action are likely to be dwarfed by the costs of inaction.

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