

Nominated Discussion

H. Pitcher

NOMINATED DISCUSSION on presentation, by Dr. M. Asaduzzaman, entitled "Policy Instruments for Managing Climate Change in Developing Countries".

Dr. H. Pitcher.

Global Change Group, Pacific Northwest National Laboratory.

Reading Dr. Asaduzzaman's very interesting paper suggests three questions to me. The first question addresses new capabilities needed by Integrated Assessment Models (IAMs) in order to reflect important behavioral differences between developed and developing countries. The second question concerns how the behavior of the models might change if the models were altered to include new capability. And the third question concerns how to use the results of IAMs in a policy making context.

Before proceeding to my questions, I note that Integrated Assessment Models are on their own learning curve. The conference provides an extremely important opportunity for IAM developers to acquire significant feedback about how their models need to develop in the future. Dr. Asaduzzaman's paper is a major part of this feedback.

Question One: How should the IAM's be modified? My reading of the extensive list of differences between developed and developing countries given in part 3 of the paper suggests that two major areas need to be added to the economics component of the typical IAM. First, the models need to include the typically large informal sector characterized by underutilized labor and the large reliance on biomass, whose activities are outside of national income accounting data bases. As economic growth proceeds, population movement from this sector to the formal economy will be accompanied by large education and infrastructure requirements and by movement from rural to urban areas. It will be essential to understand the linkage between climate policies and the behavior of this sector if unexpected and unwanted changes are to be avoided. These changes will exacerbate the second important characteristic of developing economies which needs to be incorporated in the models, the long term capital shortage which implies long term non-equilibrium behavior in important markets such as electricity. The current generation of computable general equilibrium models does not handle disequilibrium solutions, and so cannot effectively model the response of developing economies to climate change policy tools.

Question Two: How will the behavior of the models change if an informal sector and disequilibrium behavior are added? In part four of his paper, Dr. Asaduzzaman discusses a series of factors which may limit the effectiveness of carbon taxes in developing economies. Adding an informal sector, capital constraints and allowing market disequilibrium in the models will further limit the effectiveness of taxes as a tool for changing demand for goods leading to carbon emissions. The capital shortages in developing economies imply we observe points on the supply curve, rather than on the demand curve. Hence it will be difficult to predict how much tax will be necessary in order to induce cutback in demand. Supply response will be difficult to estimate because capital shortages imply non-market capital allocation mechanisms. This can result in a lack of options to produce energy with low emission characteristics. The lack of low emission options can result in reduced GNP growth as a response to emissions control. Given other needs in developing countries this is not likely to be a viable option politically.

Question three: How should IAMs be used in a policy context? As the answer to question two makes clear, there may well be a decision not to participate in a carbon control strategy. This is not the same as saying the IAMs are inapplicable. The right answer may well be that,

given the whole set of needs and constraints of developing countries, carbon taxes as a control will not be appropriate for developing countries or some subset of developing countries. This is particularly true since the rapid growth in formal energy sector implies large carbon taxes will be necessary to control emissions. The positive side is that despite the institutional difficulties cited by Dr. Asaduzzaman, there is an opportunity for Joint Implementation [JI] or Activities Implemented Jointly [AIJ] to provide the most efficient possible generating capacity.

Finally, Dr. Asaduzzaman raises the institutional problem of collecting taxes, and doing this in a fair and equitable way. Such institutional limits to implementing policies cannot be foreseen in any model and this suggests that there is a fundamental limit to how large a role any model can play in policy decisions. In addition, the models are necessarily abstractions, and different models will have different abstractions, leading to different answers. Despite Dr. Asaduzzaman's plea that models should speak with a single voice, this is not likely to happen. The models are but a tool, and furthermore IAMs are not the only policy tool necessary to make a good policy decision. No single model or set of models is going to be rich enough to answer all the questions policy makers are going to have. Ultimately, they will have to rely on their judgment.