

1) Can we see meaningful reductions in global emissions without significant emissions reductions from developing countries?

Response: Halting climate change demands that global GHG emissions fall to as little as 20% of business-as-usual levels. Emission reductions that fall short of this level lead to further warming. Poorer countries are already responsible for about half of all emissions when non-CO₂ and non-industrial emissions are accounted for as, of course, they should be. And that percentage is increasing. Simple arithmetic dictates that developing countries must make deep cuts if warming is to be stopped.

2) If Congress crafts legislation to place mandatory restrictions on carbon emissions, how do you envision such a bill interacting with an international protocol? Should Congress pass a bill without provisions that require international participation, and if so, how can Congress craft legislative language that will not be ruled illegal by the WTO or instigate global carbon trade wars?

Response: Legislation like H.R. 2454 would emasculate the US climate negotiators. The only way to avoid this outcome would be for Congress to forge a tight, explicit link between the future level of US abatement costs and those which prevail in China, India, and other major sources. Without such linkage, enacting H.R. 2454 would be the equivalent of opening a round of trade talks by lowering all US tariffs to zero. If other nations care about slowing climate change, linkage would allow them to leverage investments in curbing their own GHG discharges. If they do not care, there is little point to making deep US emission cuts. Only strong linkage can avoid both emission leakage *and* the legal and administrative problems that are likely to plague all efforts to curtail it within a system of unequal GHG controls.

3) As a carbon-free source of energy, do you believe nuclear power needs to be a part of the solution?

Response: Nuclear energy must play a central role in climate policy. As already mentioned, stopping climate change entails drastic restrictions on the use of fossil fuels. Various factors limit the growth of all forms of renewables, and relaxing these limits is likely to require large investments of time and resources. Nuclear power, by

sheer process of elimination, must play a large role. Yet uranium supply will limit nuclear's growth unless large scale fuel recycling becomes economic. It follows that the development of generation IV reactors is one of the potentially highest payoff tasks of national and global energy policy.

- 4) As you know, deforestation heavily contributes to global greenhouse gas emissions. How can an international framework properly address emissions due to deforestation, particularly when measuring emissions from deforestation is so difficult?

Response: The task of constructing an international framework to constrain deforestation emissions is likely to be the smaller part of the challenge. The harsh truth is that the governments of many nations in which deforestation is taking place lack the institutional and political maturity to curb this process. In many such states, property rights are poorly defined and are enforced capriciously or not at all. Aid bureaucracies have been attacking similar problems for extended periods of time – with mixed results at best. There is little reason to expect that such efforts will suddenly gain traction. If they do not, attempts to curb deforestation emissions will make no more than halting progress, and hopes that such projects will yield large streams of offset credits for the US market are likely to be sorely disappointed.

- 5) If there is not a final protocol agreed to at Copenhagen, then what?

Response: It is already perfectly clear that the developing countries will not make significant reductions in their GHG emissions. Without such reductions, an agreement in Copenhagen can only be a symbolic one. A symbolic agreement, may, for a while, conceal failure from the less discerning, but it will not have much impact on the rate of climate change.

- 6) Even if developing nations agree to emissions caps, varying policies and carbon prices will inevitably lead to leakage. How can the United States ensure the long-term vitality of our economy when facing leakage?

Response: Leakage will threaten some sectors of the economy and many individual firms more than ~~it is to~~ the macro-economy. Indeed, the greatest macro-economic threat posed by GHG controls could prove to stem from subsidies and trade restrictions designed to curtail leakage. These countermeasures might erode the already fragile international trade regime. Yet, once the US has adopted one-sided GHG controls, the resulting protectionist pressures are likely to become nearly irresistible.

7) The February 1 edition of the India newspaper, *The Economic Times*, quoted IPCC Chairman R.K. Pachauri as saying “negotiations are going on for the conference of parties at the Copenhagen where we will have a multilateral worldwide agreement . . . Of course, the developing countries will be exempted from any such restrictions but the developed countries will certainly have to cut down on emissions.” And January 29th’s issue of the *Financial Times* quoted top U.N. climate change bureaucrat Yvo de Boer as saying: “I don’t think developing countries will accept binding targets.” What are your reactions to these statements, and what do they portend for this year’s negotiations?

Response: These two statements accurately reflect the positions of the developing countries and foreshadow the severe limitations that will apply to any international GHG control agreement likely to emerge. As indicated in a response to a previous question, these statements imply that either no agreement will emerge from Copenhagen or there will be a purely symbolic one. A symbolic outcome is likely to prove to be unstable in the long run.

8) In your testimony, you highlight the ongoing problems with China’s lack of adherence to WTO standards. Based on China’s previous actions, is there a reason to believe that China will respect its obligations and commitments under a UNFCCC treaty?

Response: To the contrary, there is good reason to believe that China would be far less meticulous in adhering to a climate agreement than it is in following WTO rules. China has gained a great deal from membership in the WTO, yet it flouts its

commitments. The Chinese government has repeatedly stated that China would not gain from any agreement that required it to accept GHG targets. Why, then, would anyone expect that China would adhere to such targets?

9) Do you believe carbon tariffs, energy subsidies, or similar policies would be permitted by the WTO? Do you anticipate extensive challenges from competing countries?

Response: The WTO process is highly politicized. Because it is, its outcomes are unpredictable. However, challenges to new subsidies and tariffs intended to offset the impacts of GHG controls are inevitable. The WTO process will, by its nature, be lengthy, and the fact that the US has already accepted the principle of “differentiated responsibilities” casts a further shadow of doubt on the outcome. Retaliation and recriminations seem inevitable.

10) How large a transformation in the global economy is entailed by the task of stabilizing greenhouse gas levels in the atmosphere?

Response: Halting climate change demands the virtual elimination of fossil fuels or subjecting their use to elaborate and expensive GHG control systems. About one-seventh of the global economy is invested in the energy sector, and the global demand for energy will double or triple during the course of the rest of this century. By inference, most of the capital in this large and fast-growing economic sector would have to be replaced – and replaced quickly. Further, many sources of GHG emissions are outside of the energy sector. Deep reductions in GHG discharges will entail revamping much of society’s private and public infrastructure as well as everything from diets and lifestyles to agriculture and forestry. Not least, this transformation would require a vast intrusion of government into areas that have resided in the private sector and, indeed, in our society at least, within the sphere of individual freedom.

11) Given the fact that stabilization of climate entails a complete rebuilding of the entire planet's energy system -- and the infrastructure that surrounds and supports it -- how long have such large scale transformations required in the past?

Response: Electrification of the global energy system began to gather steam in the late 19th Century and is still far from complete today, about 120 years later. The analogy is probably pretty good. On the one hand, electrification provided direct relatively short-term benefits to those who bore its costs and risks. Climate protection does not. On the other hand, the pace of technical change has accelerated. A century time scale is probably a reasonable guess about the time needed for 'decarbonization'.

12) From your perspective, what is the biggest obstacle to a comprehensive international treaty?

Response: Any one of several factors would doom such an agreement now and for at least several decades. The low return on investments in GHG abatement with current technology is a prime example. The well-established unreliability of commitments from many Third World governments is a second. Perhaps most important, though, is the unwillingness by the governments of China, India, and other industrializing nations to incur the political and economic costs that would accompany steep reductions in global GHG discharges. While these conditions prevail, global GHG reduction efforts will have, at best, marginal impacts.