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## **Responses from Dr. Peter H. Gleick to additional questions from the Minority Members of the Select Committee on Energy Independence and Global Warming**

December 3, 2010

Dear Select Committee,

Thank you very much for the opportunity to respond on the record to additional questions, submitted from the Minority. In particular, the nature of the questions shows clearly the challenges in dealing with the unavoidable consequences of climate change, and the continued misunderstanding and misrepresentation of science from some members of Congress, and I appreciate the ability to respond in the hopes that this kind of misunderstanding and misrepresentation will end.

### **Questions from the Minority:**

- 1) *You state, "If we act to slow climate change, and the impacts turn out to be less severe than we predict, we will still have reduced our emissions of pollutants." At what cost is this acceptable? Is it worth an aggregate income loss in the US of \$6.8 trillion from 2009 to 2029? Is it worth job losses of nearly 3 million manufacturing jobs in 2029? [Source of numbers: Heritage Foundation]*

You stipulate a number and ask how I can justify it. I reject the stipulation: This question implies that any "act" to slow climate change will lead to these costs. These particular numbers come from a partisan organization, not an independent source or an academic source or a peer-reviewed source. I therefore reject the strawman argument "is it worth job losses of xxx" when "xxx" is an assumption not supported by evidence.

Moreover, there are many policy decisions that can be made that are low cost that would still slow the rate of climate change and reduce the ultimate social, economic, and environmental damages to the United States. Your job as policymakers is not to reject **all** action, but to identify the proper action and the weigh the relative costs and benefits. Please look at all the economic assessments of the costs and benefits of climate responses, not just those that favor one ideological point of view.

- 2) *How can you talk about green jobs as a way to boost our economy in light of the colossal failures in Europe, where:*
  - *Each green job in Spain cost 2.2 jobs elsewhere in the economy;*



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- *Each green job in Italy cost 6.9 jobs in the industrial sector and 4.8 jobs across the entire economy.*

Thank you for the opportunity to address these claims, made in one witness's written testimony and in a question at the actual Hearing. It appears that these numbers are wrong and have previously been discredited. In particular, the US Department of Energy and independent academic analysts have rejected these numbers:

The Department of Energy's National Renewable Energy Laboratory stated (<http://www.nrel.gov/docs/fy09osti/46261.pdf#page=4>) that the Spanish study

*"represents a significant divergence from traditional methodologies used to estimate employment impacts from renewable energy. In fact, the methodology does not reflect an employment impact analysis. **Accordingly, the primary conclusion made by the authors -- policy support of renewable energy results in net job losses -- is not supported by their work.**" [Emphasis added.]*

The paper further concluded that experience from Spain, even if the numbers had been right, would not necessarily apply in the United States – indeed, it would behoove Congress to set policies that learn from mistakes made elsewhere:

*"The recent report from King Juan Carlos University deviates from the traditional research methodologies used to estimate jobs impacts. In addition, it lacks transparency and supporting statistics, and fails to compare RE technologies with comparable energy industry metrics. It also fails to account for important issues such as the role of government in emerging markets, the success of RE exports in Spain, and the fact that induced economic impacts can be attributed to RE deployment. Finally, **differences in policy are significant enough that the results of analysis conducted in the Spanish context are not likely to be indicative of workforce impacts in the United States or other countries.**"*

Finally, an analysis from the Wall Street Journal also suggested that these numbers are not appropriate. The *WSJ*'s Keith Johnson challenged the results in a piece on March 30, 2009, as did [an analysis](#) by Professor James Heintz from the University of Massachusetts, Amherst.

I understand why these numbers are attractive to some members of Congress and some conservative interest groups: they suggest that the costs of action to address climate change may be higher than the costs of inaction. Unfortunately, it appears that the numbers quoted above are



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wrong – the product of misleading analysis, incorrect methods and studies, and ideology rather than independent assessment.

- 3) *You say that, “In fact, it appears that many of our estimates of the rate of climate change have been too low, not too high, and climate changes are happening faster than expected.” So what you're admitting here is that your history of predicting climate change has been consistently wrong. Why should we believe you have it right now?*

This question shows a clear misunderstanding of climate science, the nature of uncertainty, and science in general. Science evolves as we learn more, and in fact, the history of climate science is remarkably consistent – over thirty years of intensive science has only strengthened the evidence for growing, dangerous, anthropogenic climate change. Despite the best efforts of scientists to disprove or weaken the science arguments around climate change, skeptics and deniers have both failed to shake the science, as my written testimony says, and they have failed miserably to produce any alternative explanation that fits our understanding of basic science, actual observations, and mathematical and computer modeling.

When our best understanding of the nature of climate science improves, and when that science suggests that climate forecasts (not “predictions”) show **accelerating** climate change, it is irresponsible to ignore the science (which says things are worse than we expect) and argue that the improvements in our understanding are a reason for inaction. When we learn new information about the worsening illness of a medical patient or when new information says that illness is worse than we expected, is the proper response to ignore the doctors and the science? No, it is to accelerate efforts. We will constantly be improving and refining our information about climate change. It is the job of Congress, as policymakers, to take the best information and make policy, not to pretend that changes in the information or inevitable uncertainties are reasons for inaction. **The scientific community has long argued that despite uncertainties, enough information is available for policy makers to take actions.** If new information later suggests changes in policy, later policymakers will be responsible for taking that into account.

- 4) *You make assertions based on computer models of the climate that cannot be validated, and in fact, have been shown to be flawed in peer-reviewed literature. Dr. Gerald Dickens, of Rice University says that “In a nutshell, theoretical models cannot explain what we observe in the geological record,” and “There appears to be something fundamentally wrong with the way temperature and carbon are linked in climate models.” This was published in Nature Geoscience last year. Why should we bet our future on your computer models?*



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The first sentence is false. Computer models of the climate are well validated and supported by overwhelming peer-reviewed literature. This question misrepresents the science, selectively quotes from a single paper, and sets up another “straw man argument:” the “peer-reviewed literature” is massive and in line with the conclusions presented in my written and oral testimony. You are misrepresenting the conclusions of the work by Dr. Dickens, who was addressing paleoclimatic records from 55 million years ago, and feedback mechanisms that are already included in current climate models. The question of the relative effects of natural climate forcings and human forcings in previous periods and the current period is extensively addressed by hundreds, if not thousands, of peer-reviewed scientific papers. Indeed, the “peer-reviewed literature” is the basis for the fact that every single national and international scientific organization of any note supports the conclusions of the climate community. The “straw man” argument that we are betting the future on computer models should be rejecting. It is equally likely – in fact more likely given what the science tells us – that if Congress continues to fail to act on greenhouse gas emissions, you are “betting the future” by ignoring the science.

- 5) *Given your support for adaptation efforts, which include an acknowledgment of the vulnerabilities of the Californian coast and population to sea-level rise, do you concur with Dr. Green’s proposals, which include phasing out the subsidization of climate risk-taking, privatization of the nation’s drinking water supply, and establishing market pricing of infrastructure?*

The argument that we must improve our ability to adapt to unavoidable climate change is made in my own written testimony. We must certainly reduce vulnerabilities to sea-level rise and many other aspects of unavoidable climate change that will result from Congress’s failure years ago to work to reduce emissions of greenhouse gases. One possible tool is improved market pricing of certain resources and infrastructure, and I agree that these can be very useful approaches if properly applied. The argument of Dr. Green for privatizing the nation’s drinking water supply is, however, an ideological and ill-conceived and poorly thought-out proposal, and I disagree with it. My own work is focused on water resources, including many publications on the pros and cons of private water systems (these are listed in my publications list on my CV, submitted with my original written testimony). That work concludes that there is **no valid argument for privatizing the nation’s water system** – indeed, our current water system (approximately 85% public and municipal systems; 15% private systems) shows clearly no compelling economic, efficiency, or service quality advantages of private systems over public systems. In addition, the complete failure of private water systems in the 1800s in the United States is what led directly to our current public design. Dr. Green, and the organization he works for, routinely and systematically promotes privatization and free markets for all resources as an ideological solution, not a solution for which there is factual or analytical support, and I consider his use of the issue of climate change as an argument for pushing turning national resources over to the private sector to be disingenuous. Moreover, I find it ironic that Dr. Green in his written

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testimony to the Select Committee can on the one hand push for markets for water and other resources, while simultaneously rejecting similar markets for carbon and other pollutants. This is an ideological inconsistency.

I personally support both appropriate economic tools and approaches such as the elimination of inappropriate economic signals, smart pricing, and correcting distorting subsidies, as well as the continued use of government tools such as regulatory methods and financing support under certain conditions. No single, narrow set of solutions will suffice.

Moreover, Dr. Green's other major point in his written and oral testimony (that efforts to mitigate greenhouse gases is a complete waste of time and resources and should not be pursued), is worse than illogical – it is dangerous. Without efforts to slow greenhouse gas emissions and reduce the speed and severity of climate change, any efforts to “adapt” will ultimately be overwhelmed and swamped by increasingly severe consequences and exponentially increasing economic costs to the United States and its citizens. **This approach is like trying to give medical aid to someone in a burning house without bothering to try to put out the fire.**

- 6) *Given that the NAS' membership is about 2500, why is the NAS letter only signed by 255 members of the Academy, representing about 10%? How many of those who signed actually have climate-related expertise?*

This question shows a gross misunderstanding of the letter and how it was produced, while simultaneously ignoring the **content** of the letter. It also suggests ignorance of the official position of the National Academy of Sciences (as the letter itself clearly notes, the letter is not the official position of the Academy but the personal opinion of the signatories).

Specifically: not all NAS members were asked to sign. The letter was circulated to a small subset of National Academy members, over a short period of time – with a focus on those members and sections with expertise in climatology, hydrology, ecosystems science, biology, geology, and climate-related fields. Of those asked, the vast majority elected to sign, including more than a dozen Nobel Laureates.

Finally, if the purpose of the question is to find out if, or imply that, the other 90% of NAS members do not support the science of climate change, that is false. The position of the National Academy of Sciences itself is extraordinarily clear in support of the strength of climate science, as seen in all of the publications and public statements of the Academy, and in the Congressional testimony of National Academy members and the President of the NAS – all of which are on record.



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Thank you for the opportunity to add these answers to the official record.

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