National Commission on Energy Policy
Task Force on Geoengineering
Bipartisan Policy Center
1225 I Street NW
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Washington, DC 20005

September 18, 2010

Dear Colleagues,

We have recently learned of your effort to assemble a report on geoengineering techniques with recommendations on a research program and funding considerations for the benefit of legislators in the US Congress. We applaud this and trust that your efforts, together with those of others will serve to highlight the importance of a focused and rigorous scientific effort that can further our understanding of the potential of the various techniques.

Our purpose in writing you is severalfold.

First, although we do not of course know the shape your report will take, we would like to stress the importance of including both carbon dioxide removal (CDR) and solar radiation management (SRM) approaches, as in the Royal Society's "Geoengineering the Climate" report, and the NAS "America's Climate Choices" recommendations. While we understand that lumping both categories under the non-technical heading of "geoengineering" has to some degree been a disservice to both, so long as the term continues to serve the purpose of a catchall for mitigation beyond emissions reductions we think it is important both categories are included.

Second, we would like to make you aware of our group's effort to organize a high quality team to focus on the ocean's role in carbon sequestration. Given that 1) the ocean dominates the climate system on long time scales, 2) the ocean is responsible for the overwhelming majority of long term carbon storage over time, and 3) the majority of the excess carbon that we have added to the atmosphere will eventually enter the deep ocean, we think that understanding the potential of the ocean in a mitigation portfolio is sensible.

On July 12-14 our team held its first workshop at the Woods Hole Oceanographic Institution in order to review the scientific motivation behind future research on ocean carbon sequestration and outline the conceptual and organizational efforts that will be required to proceed with such research. The team has agreed to move forward as the ISIS (In situ Iron studies) Consortium. The objective of the ISIS Consortium is: To assemble an international team of the world's finest observational and computational researchers in ocean and atmospheric science to resolve the impact of iron fertilization on marine ecosystems, to quantify its potential for removal of atmospheric carbon dioxide, and to improve our collective understanding of the changing ocean. A rigorous exploration of the environmental impacts

and carbon sequestration efficiency on larger spatial and longer temporal scales will be a cornerstone of the ISIS approach. This early team that has assembled, with members from Australia, Brazil, China, the UK and the US who are listed below have played prominent roles not only in the long term research history in this area, but also in the development of the governance and policy frameworks that will interact with it.

As background to our research priorities, please find attached a copy of a 2008 Science Policy forum piece "Ocean Iron Fertilization: Moving forward in a sea of uncertainty", led by Ken Buesseler and co-authored by many members of our team, as well as Ken Caldeira from your committee. This piece outlines the broad research objectives and highlights the importance of a united effort to focus on them, quoted here:

- *Field studies on larger spatial and longer time scales, because ecological impacts and CO2 mitigation are scale-dependent;*
- *Consideration of OIF in high- and low nutrient regions to understand a wider range of processes that are affected by iron, such as nitrogen fixation and elemental stoichiometry;*
- *Detailed measurements in the subsurface ocean to verify the fate of fixed carbon, including remineralization length scales of carbon, iron, and associated elements;*
- *Broad assessment of ecological impacts from bacteria and biogeochemistry to fish, seabirds, and marine mammals;*
- *Characterization of changes to oxygen distributions, biophysical climate feedbacks, and cycling of non-CO2 greenhouses gases, such as methane, nitrous oxide, and dimethylsulfide;*
- *Long-term monitoring and use of models to assess downstream effects beyond the study area and observation period;*
- *Improved modeling studies of the results and consequences of OIF, including higher spatial resolution, better ecosystem parameterization, inclusion of other greenhouse gases, and improved iron biogeochemistry;*
- *Analysis of the costs, benefits, and impacts of OIF relative to other climate and carbon mitigation schemes and to the impacts of global change if we take no action.*

We are committed to a comprehensive, multi-year effort to achieve our research objectives. This of course will require coordination with science agencies in multiple countries and a strong commitment to funding from various international governmental and philanthropic sources. In particular, we realize the importance of early engagement in the legislative process that can direct research funding priorities.

We are ready to provide any assistance you might need in clarifying research objectives in this area generally, and can also provide more specific information about the emerging ISIS Consortium goals and organization as desired.

We have a website which has just been launched and is available at http://www.isis-consortium.org

Respectfully,

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