Climos Comments on the Lieberman-Warner Climate Security Act of 2008 (S.3036)

The submitted version of the L-W Bill includes the use of carbon offsets within a comprehensive climate change regulatory strategy. We are encouraged that designers here in the US understand the crucial role that offsets should play in stimulating all sectors of the economy to seek real, low cost carbon reductions.

We note however that the L-W Bill's language excludes a large potential source of carbon reductions.

In several places, the L-W Bill qualifies biological sequestration techniques as only those of 'terrestrial' origin (see below for exact quotes). The direct implication of this is that non-terrestrial offset types are *a priori* excluded, regardless of their merits. Particularly affected are offsets generated from biological sequestration projects in the ocean.

We think there are three important points to make:

First, we note that in most places the bill is appropriately concerned with the *structure* of the regulatory mechanism proposed. Where the scientific or environmental qualifications of offsets would be of concern, the Administrator of the climate legislation is given broad authority to evaluate the quality and potential environmental impact of offset types before including them in the regulatory program. Also, the National Academy of Sciences is designated as an external reviewer of the Administrator's performance in this regard. These controls outline a process whereby the scientific merits of proposed project types can be determined by an appropriately qualified regulatory function, with independent oversight by our nation's finest scientists.

We find it curious that a potentially significant source of meaningful reductions has been precluded through the addition of an otherwise unnecessary qualifying term [i.e. 'terrestrial']. The removal of this word would allow offset types from non-terrestrial sources to qualify as appropriate based on a defensible technical rationale. We assume that the hurdle for any project type to qualify as a certified reduction under a national program will be considerable and subject to extensive scrutiny and review. By no means do we imply that this should be otherwise—rather we suggest that the framework legislation itself not intervene before an objective technical evaluation can take place.

Secondly, this precluded offset category may include a large carbon reduction potential. One technique, Ocean Iron Fertilization (OIF), has been the subject of considerable research by oceanographers for nearly 20 years. The US National Science Foundation has provided research grants for a number of open ocean demonstrations, and based on the promise of recent results, there have been numerous calls from within the scientific community for additional demonstration projects at larger scale to address remaining uncertainties [1-3].

We cite the involvement by some of the United States' most respected scientists in our own effort as an example of the considerable recent attention that this technique has received. Our Chief Science Officer, Dr. Margaret Leinen was the recent Assistant Director, Geosciences for the US National Science Foundation. Our Science Advisory Board includes Dr. Rita Colwell, former Director of the US National Science Foundation, Dr. Tim Killeen, Director of the National Center for Atmospheric Research and past President of the American Geophysical Union, Dr. Bob Gagosian, former President of Woods Hole Oceanographic Institute and Dr. Tom Lovejoy, President of the Heinz Center for Economics and the Environment and Science Advisor to three previous US presidents.

We believe the weight of scientific evidence suggests that OIF has the potential to sequester significant amounts of carbon. Offsets from OIF projects would be characterized by high performance on standard quality metrics (e.g. additionality, permanence, etc…)[4]. If ocean iron fertilization is conducted in the deep ocean, far from land, we believe environmental concerns will be addressable and avoidable. Indeed, there is some evidence that iron fertilization could provide positive ecological benefits by increasing the amount of phytoplankton at the base of the food web, which results in an observable increase in fish activity[5, 6].

We in no way mean to imply that Ocean Iron Fertilization should be given special consideration, or that it is ready for immediate consideration by regulators as a mature technology. However, we find the structural exclusion of potentially meaningful mitigation techniques for no apparent reason to be inconsistent with an otherwise extraordinary and landmark piece of legislation.

Lastly, we note that the L-W Bill places particular importance on developing carbon offsets from technology that removes carbon dioxide from the atmosphere via biological means. Examples include forestation activities, and changes in agricultural practices. Eligible offset types are described in detail in Section 313. This section also defines procedures for certifying offsets and determining whether offsets are *real*, *permanent*, and *additional*. Other sections in Title III define programs that will encourage the development of innovative methodologies to quantify biological sequestration techniques. Ocean Iron Fertilization is clearly consistent with these elements of the L-W Bill. We note that the large majority of the world's carbon (well over 80%) lies in the deep ocean, the large majority of which has gradually accumulated over the last billion years as a result of the continuous "biological pump" driven by the growth of photosynthetic organisms at the ocean surface.

Though this process naturally takes place in the open ocean, outside of our national jurisdiction, its potential to assist the global community in achieving our overall atmospheric targets is no less diminished. To the extent that the US also considers international sources of credible carbon reductions as an economic way to meet our objectives more quickly and more rapidly, we suggest that this process—and other potentially credible approaches which fail the territoriality exclusion—be allowed a defense on their own merits.

Recognizing that society today does not know all of the solutions needed to effectively prevent dangerous climate change, and that the problem is continuing to exceed the worst of previous predictions, the L-W Bill should not arbitrarily exclude any class of carbon offsets. Therefore it is our opinion that the word "terrestrial" should be removed from the definition of an "Offset Project" on line 5, Page 28 of the Bill. Additionally, "terrestrial" should also be removed from the definition of eligible offset projects on line 20, Page 84.

Let the science decide.

Relevant Text of the L-W Bill (S.3036)

Page 28: Section 4 -- Definitions
3 (35) OFFSET PROJECT.—The term ''offset
4 project'' means a project that reduces emissions or
5 increases terrestrial sequestration of greenhouse
6 gases from sources or sinks that would otherwise not
7 have been covered under the limitation on the emis-
8 sion of greenhouse gases under this Act.

Page 84: Section 303 – Eligible Offset Project Types
19 (D) subject to the requirements of this
20 subtitle, any other terrestrial offset practices
21 identified by the Administrator, including—

1. Boyd, P.W., et al., *Mesoscale Iron Enrichment Experiments 1993-2005: Synthesis and Future Directions.* Science, 2007. 315(5812): p. 612-617.
2. Buesseler, K.O., et al., *ENVIRONMENT: Ocean Iron Fertilization--Moving Forward in a Sea of Uncertainty.* Science, 2008. 319(5860): p. 162.
3. *STATEMENT OF THE IOC AD HOC CONSULTATIVE GROUP ON OCEAN FERTILIZATION*, Intergovernmental Oceanographic Commission, 2008. Available at: http://iodeweb3.vliz.be/oanet/OAdocs/IOC_LCSGStatement.pdf
4. *Ocean Fertilization as an Effective Tool for Climate Change Mitigation*, in *Greenhouse Gas Market Report 2007*, D. Lunsford, Editor. 2007, International Emissions Trading Association. p. 136-141.
5. Smith, K.L.J., *Free-Drifting Icebergs: Hot Spots of Chemical and Biological Enrichment in the Weddell Sea.* Science, 2007. 317(27 July): p. 478-482.
6. Takeda, S. and A. Tsuda, *An in situ iron-enrichment experiment in the western subarctic Pacific (SEEDS): Introduction and summary.* Progress in Oceanography, 2005. 64(2-4): p. 95-109.