

ENGR 3520 – Group Project

Global climate change caused by the accumulation of greenhouses gases such as carbon dioxide is a pressing issue that could significantly impact humanity during *your lifetime* (see for example, *Science*, September 25, 2009 editorial by Energy Secretary S. Chu and other contributors).

This issue is fundamentally and inextricably a material balance problem, with the atmosphere serving as the system or control volume. Essentially, carbon dioxide is accumulating because the quantity entering the atmosphere by a variety of source streams exceeds the quantity exiting this system to various sinks.

Your group (3-4 students) project involves analyzing the global carbon cycle. What are the “input”, “output”, “generation” and “accumulation” terms in a material balance? What are their numeric values? How well are these terms understood, and the values known? How much variability is inherent in each of these terms? How much are each of these terms subject to change as a result of climatic changes? What are the proposed solutions and how do they impact the material balance? What is required to cause the accumulation term to become negative?

This project represents your chance to apply material balances to a highly relevant and timely problem, and to appreciate to complexity of our natural world. You may conclude the report with your (engineering) advice and recommendations about how carbon dioxide accumulation is to be reduced. Alternatively, you might provide engineering advice and recommendations that no action is necessary. Your advice must be based on sound reasoning related to this complex material balance.

The report will be due ~~Friday, April 8, 2016~~ **Monday, April 11, 2016 at 5:00 pm.** Group members will evaluate each other team member's contributions. Grading will be based on technical accuracy, communication skills and contribution of each member. *Please name your group members (i.e., by name) only on the cover sheet, not elsewhere in the document.*

In addition to a final report, your group is expected to meet in person at least **three** times. For each such meeting, you are to complete the *Summary of Group Meeting*, sign the document, and turn in a hard copy of the document. All three summaries must be turned in no later than the report due date.

Note: In keeping with the departmental policy regarding the writing of reports, 30% of the report grade will be based on communication skills including grammar, spelling and language usage (see rubric).