

Energy and Resources Group Fall 2009 Colloquium Series (ER295)

September 9, 2009



Adam R. Brandt

Acting Assistant Professor
Department of Energy Resources Engineering
Stanford University

Greenhouse Gas Emissions from Oil Substitutes: Dynamics, Resources, and Systems Behavior

110 Barrows Hall / 4:00 p.m.

The ongoing transition to oil substitutes poses economic, environmental, and political risks. These risks are complex and intertwined, involving interactions between such diverse topics as fuel systems engineering, international energy markets, politics, climate change, and ecology. In particular, the problems of oil substitution and greenhouse gas (GHG) emissions are unavoidably linked: any shortfall in conventional oil will induce the production of oil substitutes such as unconventional hydrocarbons or biofuels, which have differing GHG emissions per unit of fuel produced. I will describe my efforts to understand this transition using a large-scale mathematical model of future transportation fuel production. In particular, I will emphasize the uncertainties inherent in such modeling efforts and describe ways to gain insight from modeling in spite of these uncertainties.

Adam Brandt received his Ph.D. from the Energy and Resources Group, U.C. Berkeley, in December 2008. His research interests include the environmental impacts of fossil energy systems, in particular those of oil and oil substitutes.