

Profile: Alex Farrell

Alex Farrell took an unorthodox route to his position as an assistant professor at UC Berkeley's Energy and Resources Group. Farrell graduated from the U.S. Naval Academy and served five years in the navy as a nuclear submarine officer, then worked in private industry for two years before he even thought about going back to grad school.

"I know of only one other person who went to the Naval Academy and ended up as a college professor—and I learned this after the fact," Farrell says. "He was my dissertation advisor."

After receiving his Ph.D. in Energy Management and Policy from the University of Pennsylvania, Farrell was a researcher at Carnegie Mellon University until he moved to Berkeley in 2003.

"One of the reasons I came here was to work on energy and climate change issues, and there isn't a better place to do that." Most of Farrell's recent work has focused on greenhouse gas emissions trading and ethanol.

Working with more than a dozen faculty from UC Berkeley and other universities, Farrell was co-director with Michael Hanemann, in the Department of Agricultural and Resource Economics, of a comprehensive study examining the economic implications of a greenhouse gas emissions trading policy in California.¹ The study, conducted for the state's Climate Action Team led by CalEPA, found that taking action to reduce global warming emissions in California would benefit the California economy. It examined a subset of the policy strategies the state is considering, and found that just eight strategies could take California halfway to the ambitious 2020 emissions reduction targets set by the governor, while increasing the gross state product by approximately \$60 billion and creating more than 20,000 new jobs.

The work has been rewarding and challenging. "It's different from trying to design such a program for the country or even a region. This question of managing greenhouse gases in industrialized economies will be a continuing interest for me."

In his work on ethanol, Farrell was the lead author of a paper with fellow professors Dan Kammen and Mike O'Hare, and three graduate students published earlier this year in *Science*.² Farrell and his group examined six high-profile ethanol studies in an effort to put to rest the ongoing debate over the energy and environmental benefits of ethanol.

"You don't have to go too far into the literature before you realize there's a great deal of confusion, because analyses by different groups and individuals are hard to compare."

They decided that the best way to add to the discourse was to make the analyses comparable. To do that they created a new model, EBAMM, which is on the Web at <http://rael.berkeley.edu/EBAMM>.

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The model finds that producing ethanol from corn uses somewhat less fossil fuel than producing gasoline, but that it will not necessarily reduce greenhouse gas emissions. Cellulosic ethanol, however, could lead to dramatic reductions in greenhouse gas emissions, the study finds. More work needs to be done on greenhouse gas effects, Farrell notes, and more metrics are necessary on other environmental effects like soil erosion or fertilizer runoff.

From this study, Farrell is branching out. He wants to develop a metric that would define sustainable, organic ethanol. He's also developing a project with the University of Nebraska to better understand how the use of cellulosic ethanol could work with the current farm economy and current agricultural practices.

Farrell clearly has found his niche in the nexus of energy and policy research. But he also says he's very happy to be teaching bright students at Berkeley. "All you really need as an educator is to have students who are motivated and capable of dealing with challenging problems, and everything else after that is easy." ■

1. Hanemann, Michael, Alexander E. Farrell, et al. "Managing Greenhouse Gas Emission in California." Prepared for California Environmental Protection Agency by California Climate Change Center at UC Berkeley. January 2006.
2. Farrell, Alexander E., Richard J. Plevin, Brian T. Turner, Andrew D. Jones, Michael O'Hare, and Daniel M. Kammen. "Ethanol Can Contribute to Energy and Environmental Goals" *Science*, Vol. 311. January 27, 2006.