Study: Regulatory hurdles hinder biofuels market

July 21 2011

Regulatory hurdles abound for the successful commercialization of emerging liquid biofuels, which hold the promise of enhancing U.S. energy security, reducing greenhouse gas emissions and serving as a driver for rural economic development, according to new U. of I. research.

In the study, University of Illinois law professor Jay P. Kesan and Timothy A. Slating, a regulatory associate with the University of Illinois Energy Biosciences Institute, argue that regulatory innovations are needed to keep pace with technological innovations in the biofuels industry.

"Getting regulatory approval for new biofuels is currently a time-consuming and costly process," said Kesan, who is also the program leader of the Biofuel Law and Regulation Program at the Energy Biosciences Institute. "By removing some of the uncertainty and some of the expense without compromising on the regulatory concerns, you are also removing some of the disincentives to entering the biofuel market, where we need more competition."

In the paper, Kesan and Slating focus on biobutanol, an emerging biofuel with the potential to be a viable alternative to petroleum-based fuels.

The good news for drivers: Biobutanol has a higher energy content than ethanol, meaning a car fueled with biobutanol could drive roughly 30 percent farther than if fueled with the same amount of ethanol.

Other research has shown that biobutanol is compatible with existing vehicle engines, as well as with existing fuel distribution infrastructure.

"Biobutanol is a really promising biofuel, and has the potential to further the policy decisions that have already been made by Congress," Kesan said. "This is not a hypothetical situation. We have companies currently building the capacity to produce biobutanol."

Kesan and Slating's study not only describes and elaborates on the effects of the federal Renewable Fuel Standard, but also on the Clean Air Act's regulatory framework for the commercialization of new fuels and fuel additives.

"Since biobutanol can help us meet the Renewable Fuel Standard's mandates much more quickly and effectively, it makes good economic and policy sense to line up our regulatory processes to facilitate its commercialization," said Kesan, who also holds appointments in the College of Business, the Institute of Genomic Biology, the department of electrical and computer engineering and the department of agricultural and consumer economics at Illinois.

According to Kesan, it's not clear that the U.S. can meet all the renewable fuel mandates required under the Renewable Fuel Standard.

"Congress has all these mandates on the billions of gallons that need to be made available for sale," he said. "For example, by 2022, we have a mandate for 21 billion gallons of advanced biofuel. By definition, advanced biofuel excludes corn ethanol, so we have to come up with other fuels to close the gap. Biobutanol might be the way to do that."

Kesan and Slating note that under existing regulations, biobutanol can lawfully be blended with gasoline in a concentration of roughly 11.5 to 12.5 percent by volume, depending on the density of the finished fuel.

Regulations also provide a mechanism whereby fuel manufacturers can seek a fuel waiver from the U.S. Environmental Protection Agency to allow higher blending limits than current regulations allow. But according to the authors, this is currently a very onerous process. While it might be legal to blend 16 to 17 percent biobutanol with ordinary gasoline based on pre-existing waivers granted in the 1980s, there is a great deal of uncertainty as to whether the EPA would allow this.

"One of the things we're suggesting is to remove this uncertainty by updating the regulations to allow higher blending limits for biobutanol," Slating said. "The interesting thing here is that the EPA could actually do this on their own. The regulation that effectively sets the default blending limit for biobutanol is simply an agency interpretation of an undefined phrase enacted by Congress. Specifically, the Clean Air Act says that no fuel manufacturer can commercialize a new fuel that is not 'substantially similar' to the fuel that the EPA uses in its emissions certification process. As Congress opted to not specify what constitutes a 'substantially similar' fuel, the task is left to the EPA's discretion."

"The permissible blending limits for alcohol-based biofuels are closely tied to the oxygen content of the finished fuel," Kesan said. "In the past, the EPA has agreed that fuels containing up to a certain oxygen-content have no negative effects on engine emissions. Well, if that's the case, then let's simplify the regulations and allow all fuels to contain this level of oxygen. This would provide a larger potential market for biobutanol manufacturers without the need for them to endure the unnecessary uncertainty associated with trying to rely on a pre-existing fuel waiver."

A fast-track review process should also be created for new fuel waivers relating to emerging biofuels that have been designated as compliant with the Renewable Fuel Standard, the authors argue.

"If the RFS is going to achieve its goal of incentivizing the deployment

of second-generation biofuels, then manufacturers need to be assured that there will be no unnecessary delay in the fuel waiver process," Slating said. "While Congress intended this process to focus on a fuel's effects on engine emissions, opponents of biofuels have tried to turn the process into a forum to debate every aspect of biofuel production and use."

The authors also contend that new biofuels like biobutanol have the potential to spur rural economic development.

"Since the biomass feedstocks needed to produce liquid biofuels are cultivated in rural areas, an expansion in the use of biofuels will increase demand for these biomass feedstocks and act as a driver for rural economic development," Kesan said. "The facilities needed to convert these biomass feedstocks into biofuels will also likely be sited in rural areas for logistical reasons, and this too will be a boon for rural economies.

"A confluence of interests would be furthered by revamping the way we regulate biofuels."

The research will be published in a forthcoming issue of the *Wisconsin Law Review*.

More information: The paper, "Making Regulatory Innovation Keep Pace with Technological Innovation," is available online.

Provided by University of Illinois at Urbana-Champaign