

Improving logistics of biofuel raw materials

February 18 2012



Bruce Dale is a professor of chemical engineering and materials science at Michigan State University. At the 2012 AAAS meeting, he proposed a new, more sustainable, model for transporting raw materials to biorefineries for use as biofuels. Credit: Kurt Stepnitz, Michigan State University

If the increased use of biomass to produce alternative fuels is to become a reality, more attention needs to be paid to logistics – how, for example, biomass raw materials are shipped from farm to refinery, as well as the development of better ways of preparing the products for shipping.

This is a subject being tackled by Michigan State University's Bruce

Dale, a professor of chemical engineering and [materials](#) science, and is the topic of a symposium at this year's annual meeting of the American Association for the Advancement of Science, Feb. 16-20 in Vancouver, British Columbia.

Dale is suggesting a new model for getting the plant material to the biofuel production facility, or the biorefinery. The new model uses something called regional biomass processing depots – strategically located facilities that will process the biofuel feedstocks before they are shipped to a refinery.

"The question has become how are we going to get together thousands of tons of plant material to convert to fuels," he said. "That's a logistical issue which is increasingly being recognized as a key barrier."

Presently there are only five large-scale refineries in the United States that are either under construction or near completion. Eventually, Dale said, there could be as many as several hundred of them scattered about the country, each processing as much as 5,000 tons of feedstock a day.

"The depots we're suggesting be built would process 100 to 200 tons of feedstock per day," Dale said. "Once processed, we could ship it much longer distances to the large-scale refineries."

Another plus to Dale's plan: Farmers could get a piece of the action.

"There could be some economic benefit to the farmers," he said. "They could own part of the depot and then share in some of the income from it."

Because biomass materials are bulky and have a tendency to decompose, preparation of the materials for shipping also is an issue to be addressed.

One potential solution is a process developed by Dale known as ammonia fiber expansion, or AFEX. This involves taking the material and treating it with hot, concentrated ammonia.

"You simply remove the ammonia, run the treated material through a briquette maker, similar to briquettes for your charcoal grill, and when you're done you have a dense, stable, storable material, that's easy to ship and convert to biofuel," he said.

"The ultimate goal is that the depots would help create a better way to ship the [biomass](#) and cut down on the distance they have to be shipped."

Provided by Michigan State University

Citation: Improving logistics of biofuel raw materials (2012, February 18) retrieved 18 July 2024 from <https://phys.org/news/2012-02-logistics-biofuel-raw-materials.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.