
Noubar Afeyan: Biocatalysts Are Transforming Biofuels

By Dana Blankenhorn

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Every school kid knows that cows eat grass.

Their digestion systems are able to turn the cellulose in grass into simple sugars, just as your digestion system does with the starch in that doughnut you had on the way into the office.

Noubar Afeyan's Midori Renewables says it has developed a proprietary biocatalyst that can do what the cow does efficiently. The "rate limit" for biofuels is this ability to turn cellulose into sugar, which can then be turned into alcohol, he said.

If any biomass can become sugar for just pennies per pound, it will transform the business, Afeyan added.

KIOR (KIOR_) also bases its business on a biocatalyst, which in its case can be used at high temperature to turn biomass into oil and natural gas liquids. In the first seven months of this year it turned pine pellets into nearly 360,000 gallons of gasoline, diesel and fuel oil using its catalyst, at a plant in Columbus, Miss.

This was just one-fourth of its production target, which sent the stock tumbling, but Raymond James analyst Pavel Molchanov, who is usually quite bearish, called this a buying opportunity. "The business model remains valid," he told RenewableEnergyWorld.

Efficient biocatalysts are the holy grail of the biofuels industry. What Biofuelsdigest calls "Planet Houston" won't show interest in biofuels until it can produce useful refinery inputs at \$2.40/gallon, well below the cost of regular gasoline. Kior thinks it can get its costs down to \$2.25/gallon with an improved facility in Natchez, Miss. Afeyan won't speculate on the cost of his energy, being focused on the cost of producing the sugar that creates the energy. But the "performance was compelling," he said, and his catalyst is non-toxic, delivering sugar at just one-third the price of other solutions. He expects Midori to have further announcements in a few weeks.

As indicated above, our body produces biocatalysts naturally, called protein enzymes, and such enzymes are at the heart of all sorts of natural chemical transformations, including the brewing of beer. What's new is the application of genetic engineering to produce custom catalysts that can be patented, and the scale on which their producers wish to work.
