

# Supercritical water could lead to biomass-to-fuel conversion on a large scale

October 3 2011, by Lisa Zyga



This diagram illustrates how Renmatix's Plantrose Process uses water in its supercritical state to create cellulosic sugar from biomass. Animated version available at [renmatix.com](http://renmatix.com). Image credit: Renmatix

(PhysOrg.com) -- Converting agricultural waste into vehicle fuel has so far been an enticing yet elusive endeavor, at least on the industrial scale. But recently the Georgia-based company Renmatix has taken steps toward this goal by opening a research and development center in King

of Prussia, Pennsylvania. The company will attempt to produce an efficient and cost-effective method for extracting the sugars from cellulosic biomass, which can consist of wood chips, switchgrass, and other non-edible parts of crops. The sugars can then be converted into motor fuels such as ethanol or feedstock chemicals.

The biggest difference between Renmatix's technology and that of others is that, while its competitors have tried various combinations of steam, acid and expensive enzymes to convert the [biomass](#) into fuel, Renmatix uses compressed hot water. The water is at a pressure and temperature that is so high that the water is in a "supercritical" state of matter. Supercritical water has been previously used in industrial applications including coffee decaffeination and pharmaceutical processes, but not in a biomass-to-fuel process at a significant scale.

"The process breaks down a wide range of non-food biomass in seconds, uses no significant consumables and produces much of its own process energy," the company stated in a press release. "Current methods of breaking down biomass require expensive enzymes or harsh chemicals, and can take up to three days to yield sugars. With its water-based approach, Renmatix is able to provide cellulosic sugar affordably and on large-scale."

At a pilot plant in Kennesaw, Georgia, the company has scaled its process to convert three tons of woody biomass to sugars per day. By locating its newest plant in the greater Philadelphia area, the company hopes to attract potential employees with material science and engineering skills to increase this rate.

Among Renmatix's supporters is board member John Doerr, a partner at Kleiner Perkins Caufield & Byers who is well known for his early investments in Amazon, Google, Sun Microsystems and other tech companies. Investors are interested because cellulosic biomass

technology could potentially provide a cheaper, cleaner source of energy than gasoline, as well as reduce the country's reliance on oil. More abundant than corn and without the downside of diverting food resources, cellulosic biomass looks promising, as long as it can be scaled up and commercialized. While earlier technologies have proven successful on the small scale, the biggest challenge holding them back has been the difficulty involved in large-scale production at competitive prices.

"In the twentieth century, petroleum was the basis for making materials, chemicals and fuels," said Mike Hamilton, CEO of Renmatix. "In the twenty-first century, sugar is replacing petroleum as the raw material for those industries. Renmatix will provide those sugars faster and cheaper than anyone else."

**More information:** <http://renmatix.com>  
via: [Renmatix press release](#) and [The New York Times](#)

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