

## Some Other Biofuels

*Biomass cogeneration.* Energy can be generated by burning wood and grass to power a steam-driven generator or industrial process.<sup>i</sup> For instance, some lumber mills burn their sawdust and scraps to create electricity or heat for the drying facility. The practice saves consumption of other fuels and disposes of problematic waste material. The location of such plants close to industrial facilities means residual heat can be captured and used to heat other facilities. Cogeneration like this saves additional fuel, provides a valuable service, and creates a new revenue stream. While creation of energy from material that is otherwise considered waste is highly desirable, the overall size of the resource is small compared to total energy consumption.<sup>ii</sup> Such practices should be encouraged, but are a small part of the solution.

*Biodiesel.* Like petroleum, biological oils can be processed to yield diesel fuel. Biodeisel is biodegradable, non-toxic, often has a pleasant smell, burns cleaner than petroleum diesel, is compatible with today's infrastructure, and is supported by some car manufacturers. Biodiesel can be manufactured from algae, vegetable oils, animal fats, and restaurant grease. Some of these are waste products that producers otherwise find difficult to dispose of. Controversy exists over the net energy balance of biodiesel, with estimates ranging widely.<sup>iii</sup> There are over 160 biodiesel suppliers in Missouri,<sup>iv</sup> although its use is so small that it is not even tracked in the alternative fuels data published by the Energy Information Administration. Producing biodiesel from agricultural products would require diversion of large areas of cropland from food to fuel, just as we found with ethanol. Perhaps the best hopes for biodiesel lie in jatropha, an African weed that produces large amounts of oil, or in some species of algae that produce 20 times as much oil per acre as do soybeans.<sup>v</sup> Right now, however, it is too new an energy source to be well understood.

*Biogas.* In the absence of oxygen, plant and animal waste (including sewage) decay to release methane, which can be deodorized and burned as fuel. It is not a high-quality fuel, so it is not fed into the natural gas distribution system, but rather is burned on-site to provide heat or generate electricity. Landfills, sewage plants, and concentrated animal feeding operations (CAFOs) are candidates for biogas operations. In these uses, biogas generation requires initial capital investment for the digestion equipment, but otherwise requires little energy input. In CAFO applications, biogas generators reduce the volume of organic waste by half and generate electricity for running the farm.<sup>i</sup> These are very substantive benefits! Biogas should be encouraged wherever it is feasible.

Biomass, biodiesel, and biogas all release CO<sub>2</sub> when they are burned to provide energy, just like hydrocarbons. Since they consist of biological material, however, the CO<sub>2</sub> was captured by current era organisms as they grew. Thus, they are considered carbon neutral energy sources, and they prevent the release of CO<sub>2</sub> that would have occurred if other energy sources had been used instead.

---

<sup>i</sup> Nersesian, Roy. (2007) *Energy for the 21<sup>st</sup> Century*. Armonk, NY: M.E. Sharpe. For an example of a recent biomass plant, see the Grand Prairie Eco-Center, [www.canhydro.com](http://www.canhydro.com).

<sup>ii</sup> *Wood/wood waste*. Energy Information Administration. Retrieved 12/7/2007 at <http://www.eia.doe.gov/cneaf/solar.renewables/page/wood/wood.html>

<sup>iii</sup> Van Gerpen, Jon, & Shrestha, Dev. *Biodiesel energy balance*. Department of Biological and Agricultural Engineering, University of Idaho. Retrieved online 12/7/2007 at [www.uidaho.edu/bioenergy/NewsReleases/Biodiesel%20Energy%20Balance\\_v2a.pdf](http://www.uidaho.edu/bioenergy/NewsReleases/Biodiesel%20Energy%20Balance_v2a.pdf).

<sup>iv</sup> National Biodiesel Board, retrieved 12/7/2007 at <http://www.biodiesel.org/buyingbiodiesel/distributors/showstate.asp?st=MO>.

<sup>v</sup> Source: The Petroleum Club, cited in *Biodiesel*, Wikipedia, retrieved 12/7/2007 at <http://en.wikipedia.org/wiki/Biodiesel>.