Biomass to Biofuels: SynSel is a Practical Solution to Reduce Pollution

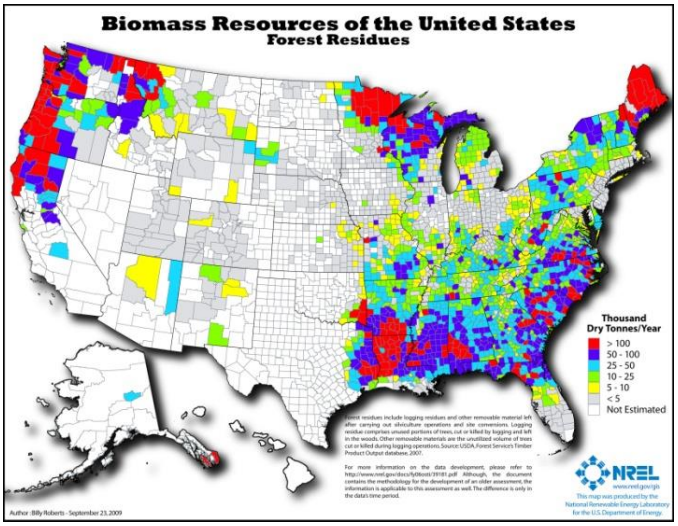
Better Environmental Solutions

Extreme climate change impacts are real and immediate actions are needed, according to the US Department of Defense. The Environmental Protection Agency states the three main sources of carbon air pollution are burning coal for electricity, petroleum fuels for transportation, and other sources like industry and homes. One proven, practical solution is to manufacture and use low carbon biofuels with or instead of gasoline and diesel in vehicles. This creates jobs, and more energy independence.

SynSel Energy www.synsel.com integrates state-of-the-art, environmentally-responsible BTL (Biomass-to-Liquid) technologies to convert wood waste into Second Generation Bio-Fuels. Rather than offering a single technology as a "one-size-fits-all" solution, SynSel strives to integrate only the best proven state-of-the-art, environmentally-responsible synthetic fuel technologies. SynSel's chosen technologies are proven, practical, cleaner, more secure, and cost-effective.

1. **Proven:** SynSel standards specify the use of **proven** technologies to convert wood waste into synthetic biofuels. These second generation biofuels are "tank ready" environmentally friendly fuels manufactured with environmentally safe methods that have minimal impact on the land, water or air.
2. **Practical:** SynSel is **practical**. A leading Biofuels trade journal reports that one of SynSel's chosen BTL technologies, **"would be a 'breakthrough' technology that solves the key issues."**
3. **Cleaner:** SynSel synthetic fuels will significantly reduce greenhouse carbon dioxide emissions according to a comprehensive well-to-wheel study by Michigan Technological University. Emissions from the use of Syn-diesel are Sulphur-free, and do not contain 40 contaminants found in petroleum diesel emissions. SynSel's environmental standards require environmentally safe biofuel manufacturing processes with minimal impact on the land, water or air in confidential third-party Life Cycle Analysis models.
4. **More Secure**: The SynSel processes create synthetic gasoline, diesel and kerosene fuel in America where we need it. This will create a more secure energy future according to the Energy Security Leadership Council. The US Navy-DOE-USDA September 19, 2014 announced $210M in grants to 3 firms producing drop-in fuels for $3.50 per gallon from renewable sources. Along with this, the DOE's ARPA-E program (Advanced Research Projects Agency – Energy) announced on October 10th $30M in grants are available for research for the TERRA program: Transportation Energy Resources from Renewable Agriculture.

5. **Cost-effective:** While SynSel's chosen BTL technology is capable of processing any dry cellulosic biomass, SynSel has chosen clean wood waste biomass as the initial feedstock. This feedstock provides the highest "BTU per dollar" available, at more than 7 times the corresponding value of crude oil, yellow grease and palm oil. There is a ready and abundant domestic supply of clean wood waste without the need to use "round wood" for feedstock. SynSel sources wood waste from lumber mills and harvesting operations.



This National Renewable Energy Lab map shows that the U.S. has an estimated 258 million tons of biomass, of which there is an estimated 174 Million tons (137 million dry tons) per year of unallocated wood waste. This represents enough waste wood to supply over 680 SynSel SGB-Refineries in the US. If NON-wood biomass is included (corn stover, switch grass, rice hulls, etc.) there is enough biomass in the US for 2,100 SynSel plants. SynSel SGB-Refineries are sited close to the source of the feedstock, where job-creation is incentivized with federal programs and transportation and handling costs are negligible.

The USDOE National Renewable Energy Lab (NREL) calculated the minimum fuel sales price for fuel produced by one of SynSel's chosen technologies will be $1.60 per gallon (without subsidies) using waste wood as the feedstock.

Biomass Leads the Way-- Department of Energy reports show that biomass is actually our leading non-hydro renewable electricity source today producing more energy than wind and solar combined.

The US has an abundance of recoverable biomass that could, if harvested economically, replace a significant amount of gasoline or diesel that is currently imported, with a corresponding creation of biofuel industry-related jobs. The Clean Air Act requires increasing soot, smog and CO_2 reductions. SynSel technologies can help achieve these goals through the deployment of innovative, economical and environmentally-responsible BTL technologies.

There are enormous opportunities throughout the nation to convert biomass to synthetic fuel with SynSel Second Generation Bio-Refineries, including proposed plants at shuttered paper mills throughout the US. These simple steps can give us cleaner air, more jobs, and save us money.

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