Biofuel Fact Sheet

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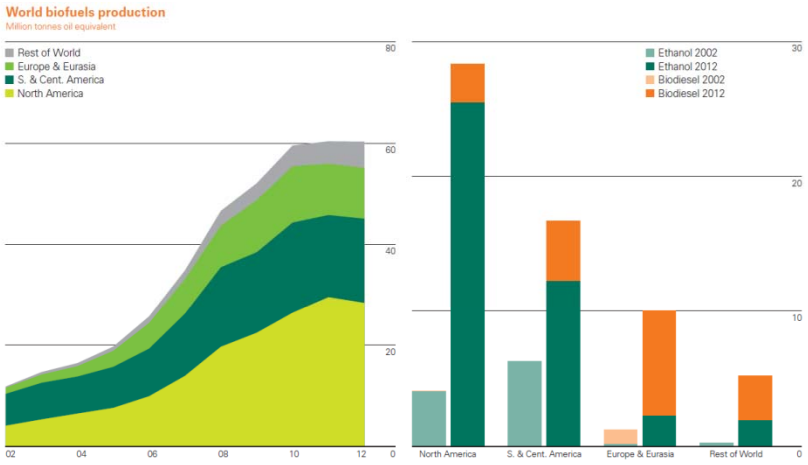
Overview:
- Applications for automobiles as an alternative to gasoline (ethanol) or diesel (biodiesel)
- Renewable: plants absorb carbon dioxide that is emitted from car exhaust
- Biodiesel emissions better than ethanol right now

Crops Used for Biofuel:
- Corn
- Grass
- Wood
- Algae
- Soy beans
- Sugar

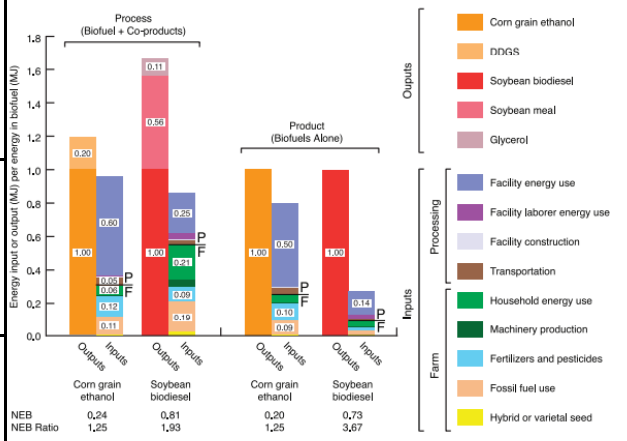
Biofuel Life Cycle:
- Harvested as feedstock
- Transported to refinery
- Biomass is broken down
- Fuel is distributedfor consumption
- Consumption by cars

World Stats
(from 2002-20012)

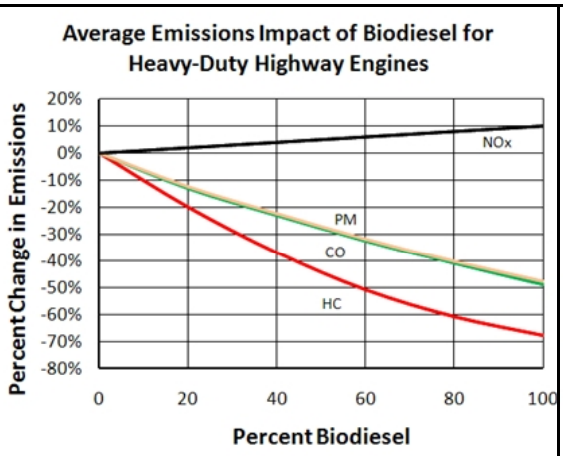


Energy & Emissions Stats:
- Ethanol yields 25% more energy than invested in production
- Ethanol reduces greenhouse gas emissions by 12%
- Biodiesel yields 93% more energy than invested in production
- Biodiesel reduces greenhouse gas emissions by 41%

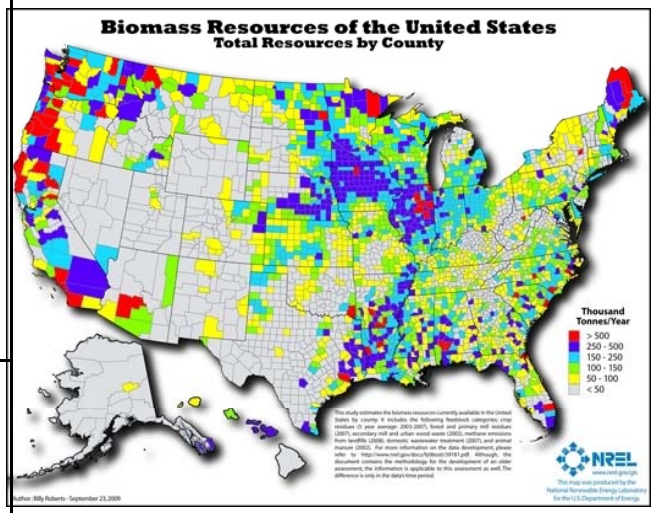
Energy Analysis for Biofuel Production



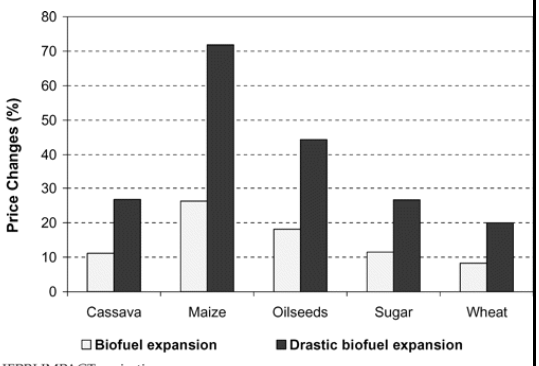
Cellulosic Ethanol (The Future):
- A small amount of fuel is used to convert biomass to ethanol
- Uses fewer chemicals and less energy to harvest biomass
- Reduces greenhouse gas emissions by 85%



Benefits:
- Potential to diminish reliance on fossil fuel imports (2/3 of petroleum)
- Reduction in CO2 emissions
- Relatively easy to change car engine to operate on biofuel
- Ethanol is currently cheaper than gasoline



Changes in World Feedstock Prices in 2020 Referenced to 2008



Source: IFPRI IMPACT projections.

Concerns:
- Inefficient use of energy
- Uses coal and natural gas to synthesize biofuels
- Effect on food prices
- Not enough resources to satisfy energy demand
- Difficult to operate at cold temperatures
- Biodiesel is currently more expensive than diesel

US Resources:
- Dedicating all US production of corn and soybean to biofuels would meet 12% of gasoline demand
- Dedicating all US production of corn and soybean would meet 6% of diesel demand

Overview:

Biodiesel. N.p., n.d. Web. 15 Apr. 2014. <http://www.afdc.energy.gov/fuels/biodiesel.html>

•*Biofuel Facts*. N.p., n.d. Web. 15 Apr. 2014. <http://environment.nationalgeographic.com/environment/global-warming/biofuel-profile/>.

•Hill, Jason. "Enviornmental, economic, and energetic costs and benefits of biodiesel and ethanol biofuels." *University of Minnesota*: n. pag. Print.

Crops:

•*Biofuels Issues and Trends*. N.p.: US Energy and Information Administration, 2012. Print.

•*Basic Information: Biofuels*. N.p., n.d. Web. 15 Apr. 2014. <http://www.epa.gov/ncea/biofuels/ basicinfo.htm>.

Benefits

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•*Biofuel Facts*. N.p., n.d. Web. 15 Apr. 2014. <http://environment.nationalgeographic.com/

•Songstad, D. D. "Historical Perspective of biofuels: learning from the past to rediscover the future." *In Vitro Cell* (2009): n. pag. Print.

Concerns:

•*Biofuel Facts*. N.p., n.d. Web. 15 Apr. 2014. <http://environment.nationalgeographic.com/environment/global-warming/biofuel-profile/>.

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•"Global Scenarios for Biofuels: Impacts and Implications." *Applied Economic Perspectives and Policy* (2008): n. pag. Print..

Cellulose

•*The Benefits of Biofuels*. N.p., n.d. Web. 15 Apr. 2014. <http://www.energyfuturecoalition.org/biofuels/fact_biodiesel.htm>. >.

Biofuel Life Cycle:

•*Biofuels*. N.p., n.d. Web. 15 Apr. 2014. <http://bio.sandia.gov/solutions/biofuels/index.html>.

Energy & Emissions Stats

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US Reserves

•Hill, Jason. "Enviornmental, economic, and energetic costs and benefits of biodiesel and ethanol biofuels." *University of Minnesota*: n. pag. Print. Rosegrant, Mark W.