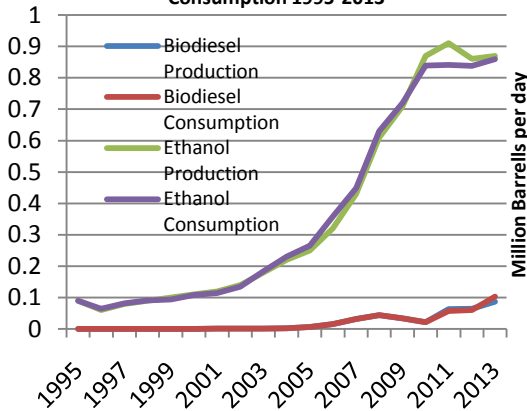




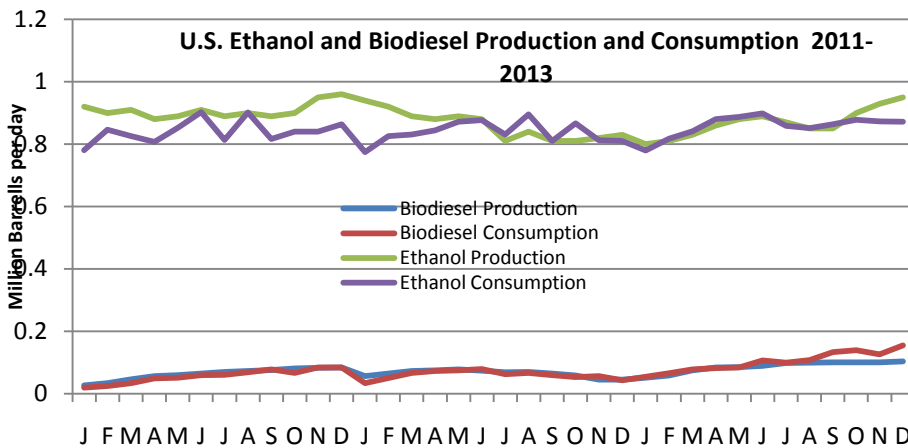
Domestic Overview and Current Policies

U.S. Ethanol and Biodiesel Production and Consumption 1995-2013



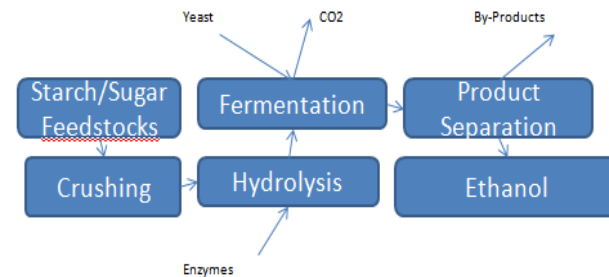
- Ethanol and Biodiesel Production and Consumption have increased over last 15 years.
- Rapid increase in ethanol production/consumption in early to mid 2000's
- Currently several alternative fuel tax incentives and exemptions.
- Energy Policy Act of 2005 was first legislation since Energy Policy Act of 1992

U.S. Ethanol and Biodiesel Production and Consumption 2011-2013



An Introduction to Biofuels

- Bioethanol
 - from starch or sugar rich biomass (corn)
- Biodiesel
 - from vegetable oils, used cooking oils
- Bioethanol accounts for more than 90% of total biofuel usage.
- Brazil (sugar-cane based) and United States (corn based) are world's largest ethanol producers
- Ethanol used in 5-10% blends (E5,E10) with gasoline, or higher concentrations in flex fuel engine vehicles
- Germany is largest producer of biodiesel
- Biodiesel most often used in 5-20% (B5-B20) blends with diesel fuel.
- Ethanol and Biodiesel production both constrained by land availability, and food demand.
- Sample process from biomass to fuel

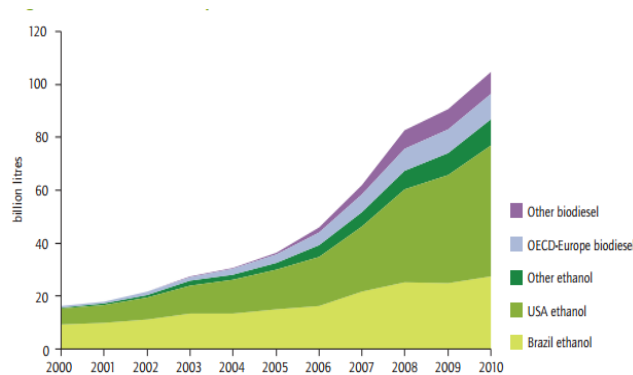


Technologies

Currently produce "1st generation" biofuels. (produced primarily from food crops). Increased interest in developing "2nd generation" biofuels (produced from non food biomass). Greater R&D and investment is needed for these "2nd Generation" biofuels to become commercially viable options.

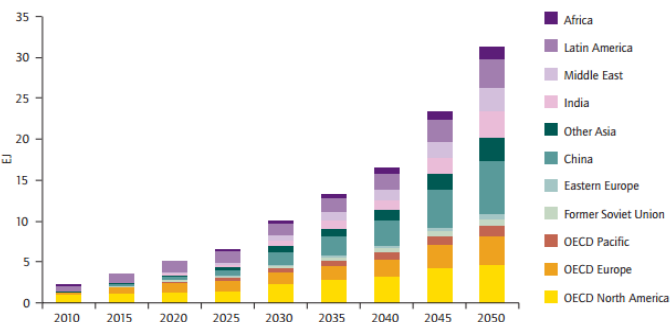
International Overview

- 22 countries currently have mandated biofuel mixture regulations.
- Most mandates require use of E5 or greater blends
- Notable countries without mandates: European Union, Japan



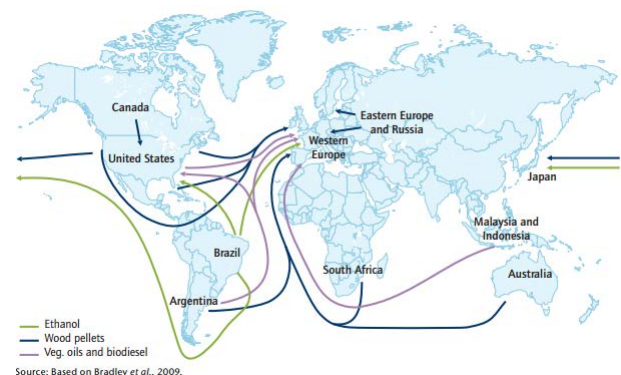
Source: IEA, 2010a.

Future Outlook

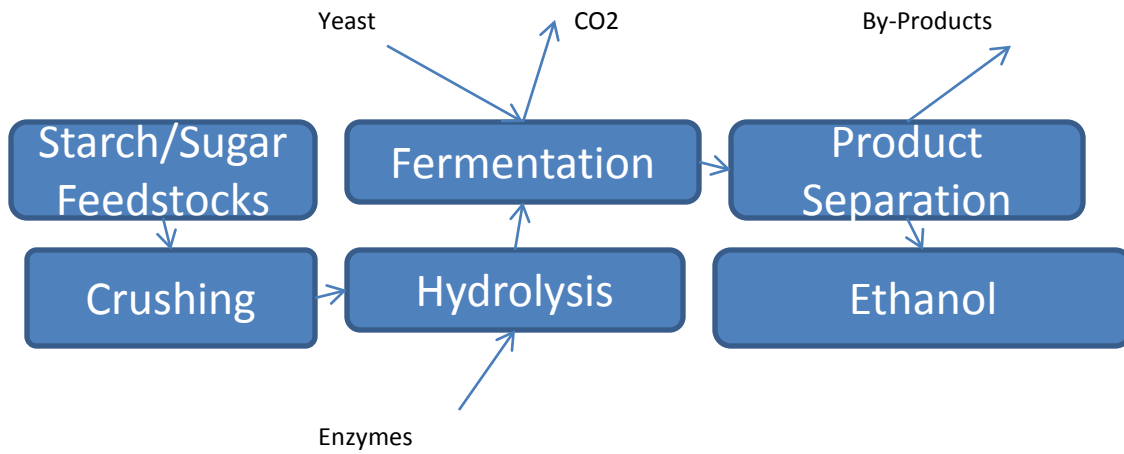


Demand expected to increase significantly by 2050. Biofuels could provide 27% of total transport fuel by 2050, and reduce CO2 emissions by 2.1 Gt per year

Note: FSU= Former Soviet Union.
Source: IEA, 2010c.



Source: Based on Bradley et al., 2009.



Domestic Overview and Current Policies

Alternative Fuels Data Center. Laws and Incentives. Key Federal Legislation. U.S. Department of Energy.
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 “IEA Energy Technology Essentials.” International Energy Agency. January 2007.
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