

IN PURSUIT OF BIOENERGY ALTERNATIVES

Rationale

World energy consumption is expected to increase 56% by 2040¹. A comprehensive energy policy that enables this demand to be met with reduced use of fossil fuels, is critical. Availability and the projected dramatic increase in demand for food and feed supplies during coming decades place a high societal cost on competition between the food and energy sectors². Renewable Energy accounted for 19% of global energy consumption in 2013³ and is the fastest growing source of world energy increasing at 2.5% annually⁴.

- The Renewable Fuel Standard mandates that biofuel increase from the 9 billion gallons produced in 2008 to 36 billion gallons by 2022. In 2014, about 35% of the grain produced in the U.S. was used for ethanol. The 2011 G-8 summit set a goal of deriving 25% of the world's transport fuels from biomass by 2050⁶.
- Renewable fuels from new refineries must reduce greenhouse gas (GHG) emissions 20% relative to life cycle emissions from gasoline and diesel⁵.
- Several types of biomass may be used for biofuels production, including cereal grains, oilseeds, sugar cane, switchgrass, miscanthus or algae grown specifically for the purpose, straws and stovers, wood crops, animal manures, food waste, municipal waste and others^{1,7}.
- An energy life-cycle balance must include the energy equivalent of coproducts from biofuel production such as distillers grains which are important energy and protein feedstuffs for animals.
- Some studies indicate that ethanol produced from corn has 25% more energy than was used in production and processing, and a 12% net reduction in GHG production. Biodiesel from oilseeds is more efficient, with a 93% net increase in energy and 41% net reduction in GHG⁸.
- There has been an ongoing debate as to whether use of grain for biofuel contributed to the increase in feed cost between 2006 and 2012. Sources of biomass for biofuels production can divert resources from the food chain to the energy system and compete for land with food crops^{8,9}. If all of the world's biomass was converted to energy, it would supply only 20% of the energy need.

Policy Statement:

ASAS supports the pursuit of bioenergy alternatives that contribute to sustainable energy production without compromising food security.

Policy Objectives:

- Adequate funding of strong fundamental research programs designed to improve the efficiency of biofuel production, with emphasis on lignocellulosic ethanol production
- Strong funding for comprehensive applied research programs to develop new generations of bioenergy crops and technologies for use of waste materials for biofuel production
- Facilitation of the commercialization of technologies that reduce competition between energy and food production and enhance the availability and quality of coproducts for animal feed.

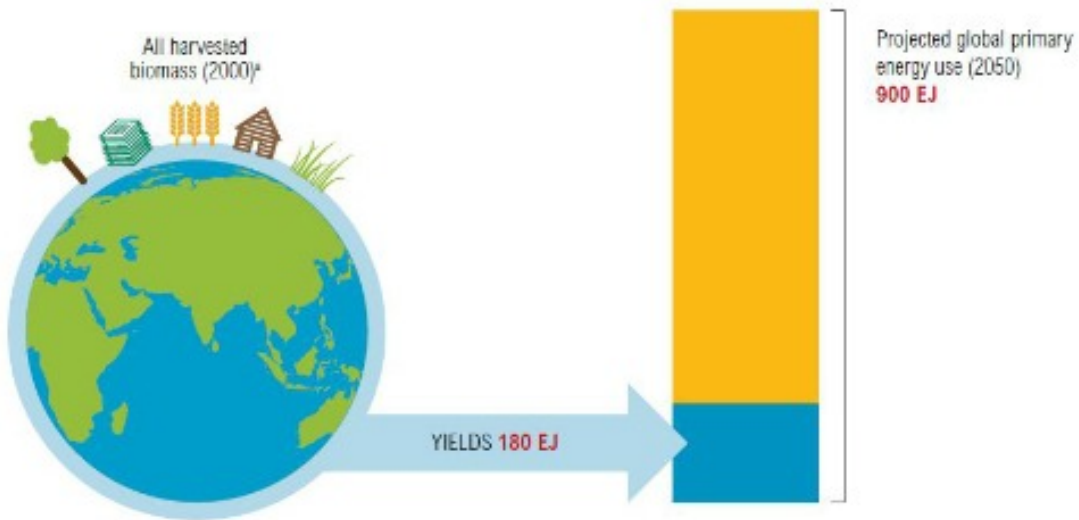
References:

1. US Energy Information Administration, 2013. www.eia.gov
2. United Nations Energy, 2007. Sustainable Bioenergy: A Framework for Decision Makers. <http://ftp.fao.org/docrep/fao/010/a1094e/a1094e00.pdf>
3. Renewables 2015 Global Status Report, http://www.ren21.net/wp-content/uploads/2015/06/REN12-GSR2015_Onlinebook_low1.pdf
4. International Energy Outlook 2014. 2014 International Energy Agency, www.iea.org
5. US Environmental Protection Agency, May 2015. <http://www.epa.gov/otaq/fuels/renewablefuels/documents/420f15028.pdf>
6. International Energy Agency (IEA) Technology Board, Paris, France. G8 Summit May 25, 2011.
7. Bioenergy Research Centers: An Overview of the Science. 2010. US Department of Energy Office of Science, Washington

9. Policy Positions: Food vs Fuel, Renewable Fuels Association, May 2011. <http://www.ethanolrfa.org/pages/policy-positions-food-vs-fuel>

10. Searchinger and Heimlich, 2015. Avoiding bioenergy competition for food crops and land. World Resources Institute. http://www.wri.org/sites/default/files/avoiding_bioenergy_competition_food_crops_land.pdf

Figure 4 | Using All of the World's Harvested Biomass for Energy Would Provide Just 20 Percent of the World's Energy Needs in 2050 (Exajoules per year)



Source: Authors' calculations based on Haberl et al. (2007), IEA (2008), and JRC (2011).
Note: a. Total amount of crops, harvested residues, grass eaten by livestock, and harvested wood contained 225 EJ, but would replace only 180 EJ of fossil fuels because of conversion efficiencies from biomass to useable energy.