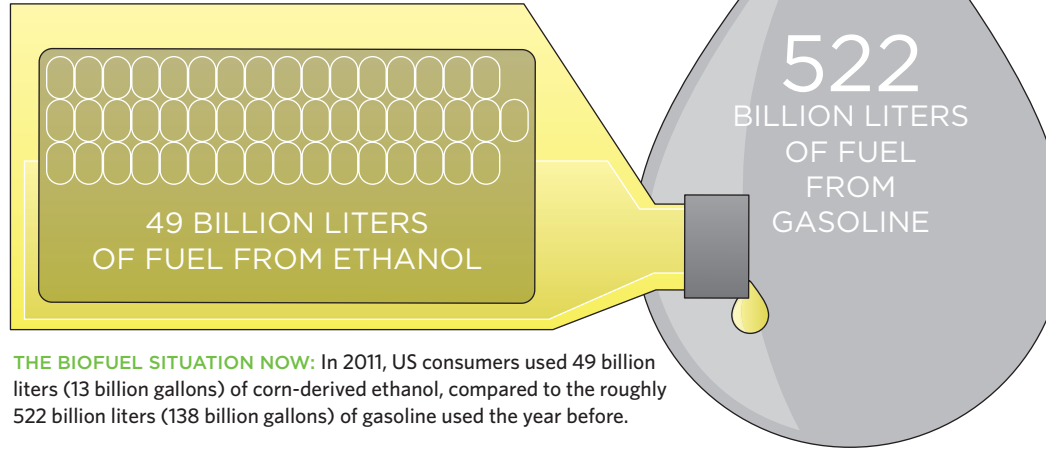
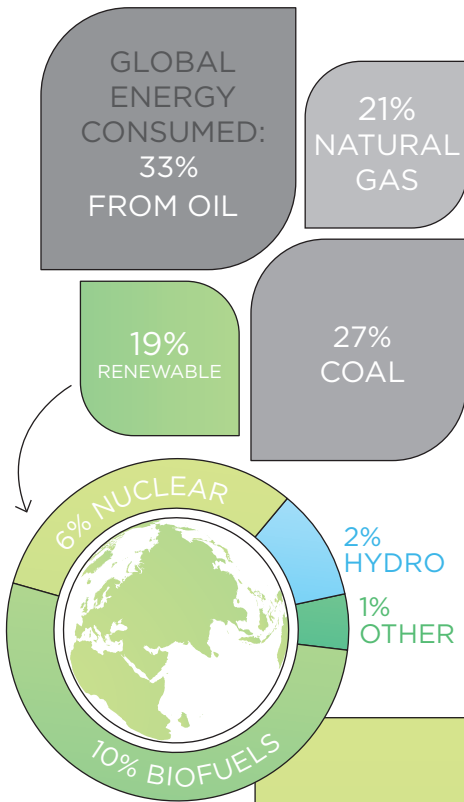


BIOFUELS BY THE NUMBERS

Of the many available no- or low-carbon methods to harvest energy, including wind, geothermal, hydroelectric, and solar approaches, conversion of plant biomass to liquid fuels is the most cost-effective strategy, currently contributing 78 percent of the total renewable energy worldwide. While some are concerned that an increased dependence on energy crops will be at odds with the use of land for production of food and feed, the next 25 years could see biofuels rise to the challenge.

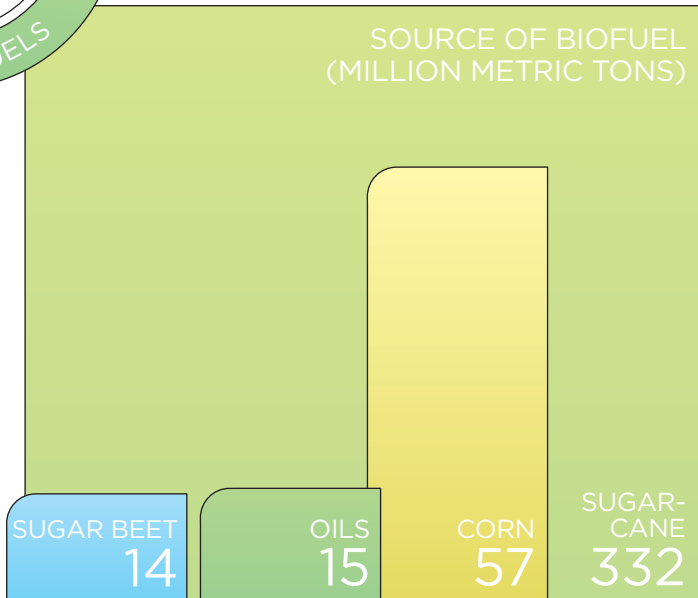
THE PROBLEM: Fossil fuels currently supply more than 80 percent of energy consumed globally and contribute to the rise of climate change-associated greenhouse gases, such as CO₂, nitrous oxide, and methane.



THE BIOFUEL SITUATION NOW: In 2011, US consumers used 49 billion liters (13 billion gallons) of corn-derived ethanol, compared to the roughly 522 billion liters (138 billion gallons) of gasoline used the year before.



WASTE NOT WANT NOT: Each year in the United States, about half a billion tons of biomass (including agricultural plant-matter waste, forest thinnings, and harvest residue) and municipal organic waste—the equivalent of about 40 billion gallons of gasoline—are thrown out. In California, 7 of the top 10 items going to landfill are organic (e.g., demolition wood/construction residues, paper, cardboard, food waste).



CAST OF CHARACTERS: There are two main types of liquid biofuels: biodiesel, produced primarily from lipids in soy, canola, other oilseeds, and palm fruits, and ethanol, made by using yeast to ferment sugar extracted from sugarcane and sugar beet, or from the starch of corn, wheat, and cassava.

POTENTIAL: With continued improvements, biofuels could meet demand for about 30 percent of all liquid transportation fuels worldwide, which came to roughly 341 billion gallons in 2011.

