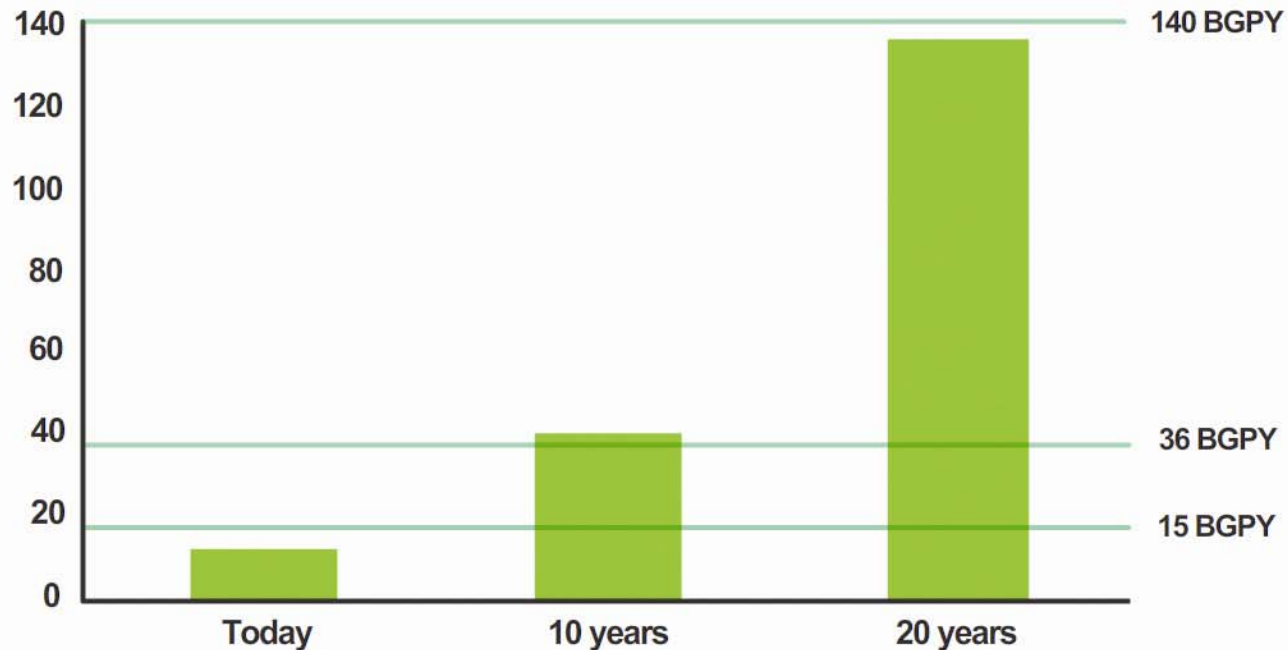


## ***Future Ethanol Production Potential Growth***



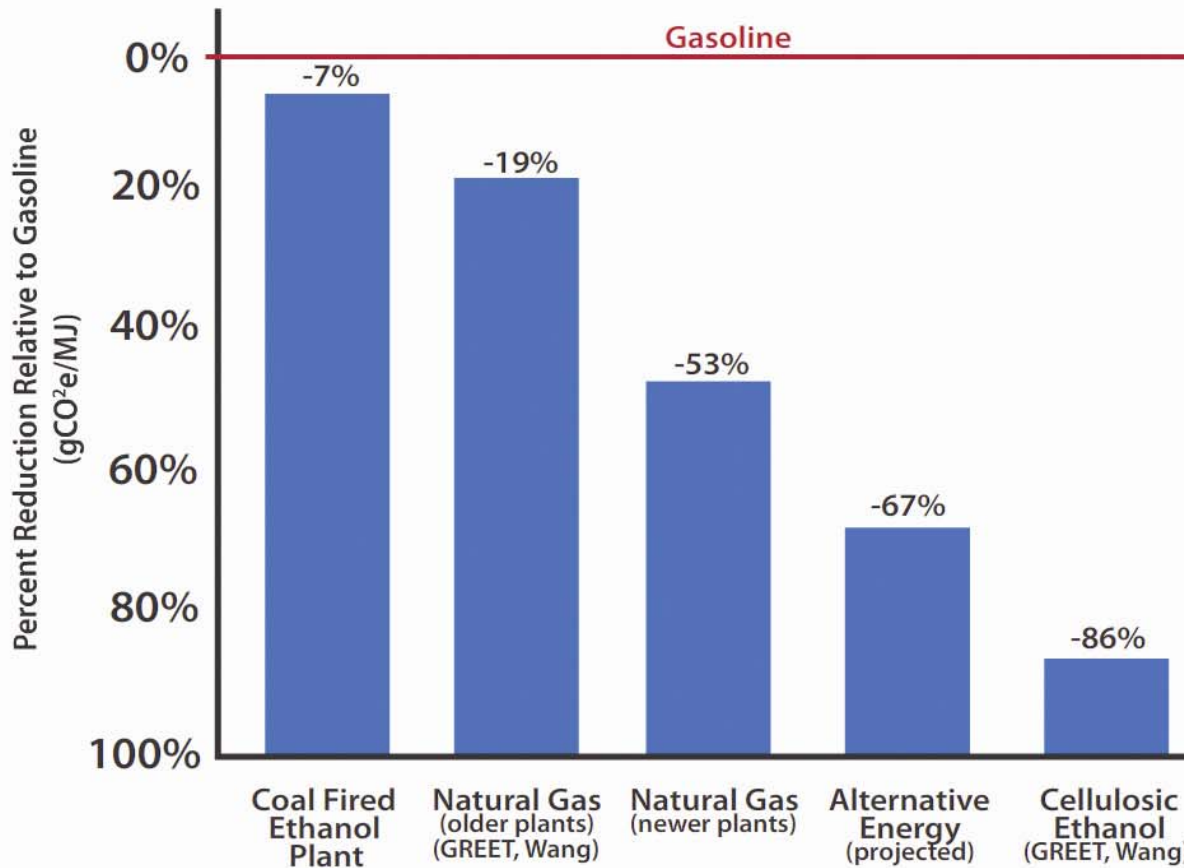
### **Ethanol's Potential: Replace Over 90% of our Nation's Gasoline Usage**

With the tremendous increases in corn yields and over one billion tons of cellulosic biomass in the United States,\* the possibilities for ethanol are staggering. If our nation has the resolve, we could almost eliminate our need for fossil fuels for automotive transportation and replace with a homegrown, environmentally friendly, renewable fuel.

*\*Source: USDA / DOE*

# Ethanol Greenhouse Gas Reduction Over Gasoline

Life cycle analysis



## Ethanol Technology Improving

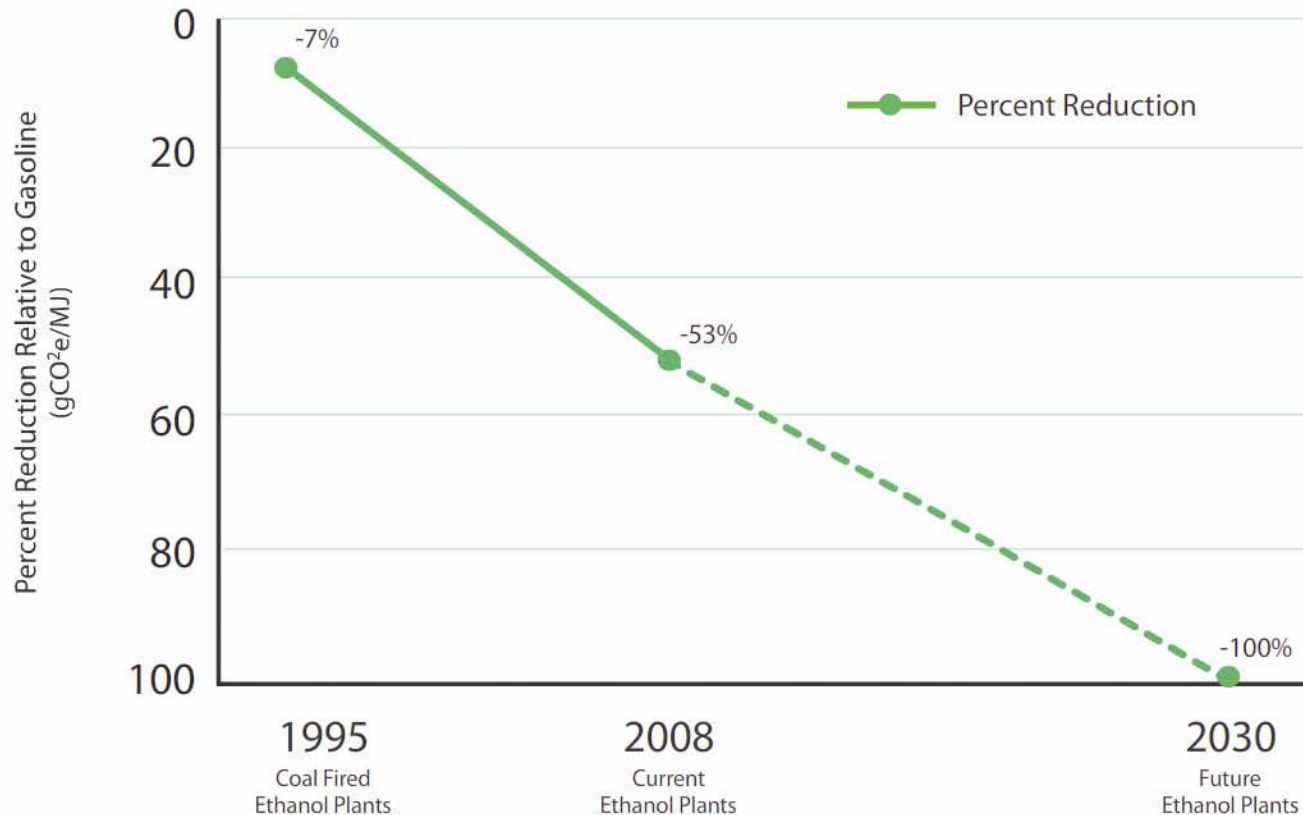
As advancements are made in ethanol production, alternative energies and agriculture, less fossil fuel is used in ethanol production.\*

A recent study by the University of Nebraska showed that modern ethanol plants reduce greenhouse gases by more than 50%.

As alternative sources of oil are used such as tar sands and oil shale, gasoline will require even more fossil fuels.

\*Source: BESS version 2008.3.0, Liska and Cassman, 2009 GREET, Wang et al, 2007.

# Environmental Advancements



*Dramatic improvements have been made in reducing ethanol's greenhouse gas emissions compared to gasoline. It is possible to eliminate all GHS emissions in ethanol production.*



## ***Cellulosic Ethanol***

- ▶ Technology nearing commercial viability
- ▶ Several pilot-scale facilities in operation
- ▶ Multiple feedstocks – corn cobs, wood chips & wood waste, stover, and other agricultural residue
- ▶ Over one billion tons of available biomass in US which could be converted to 80 – 100 billion gallons of ethanol