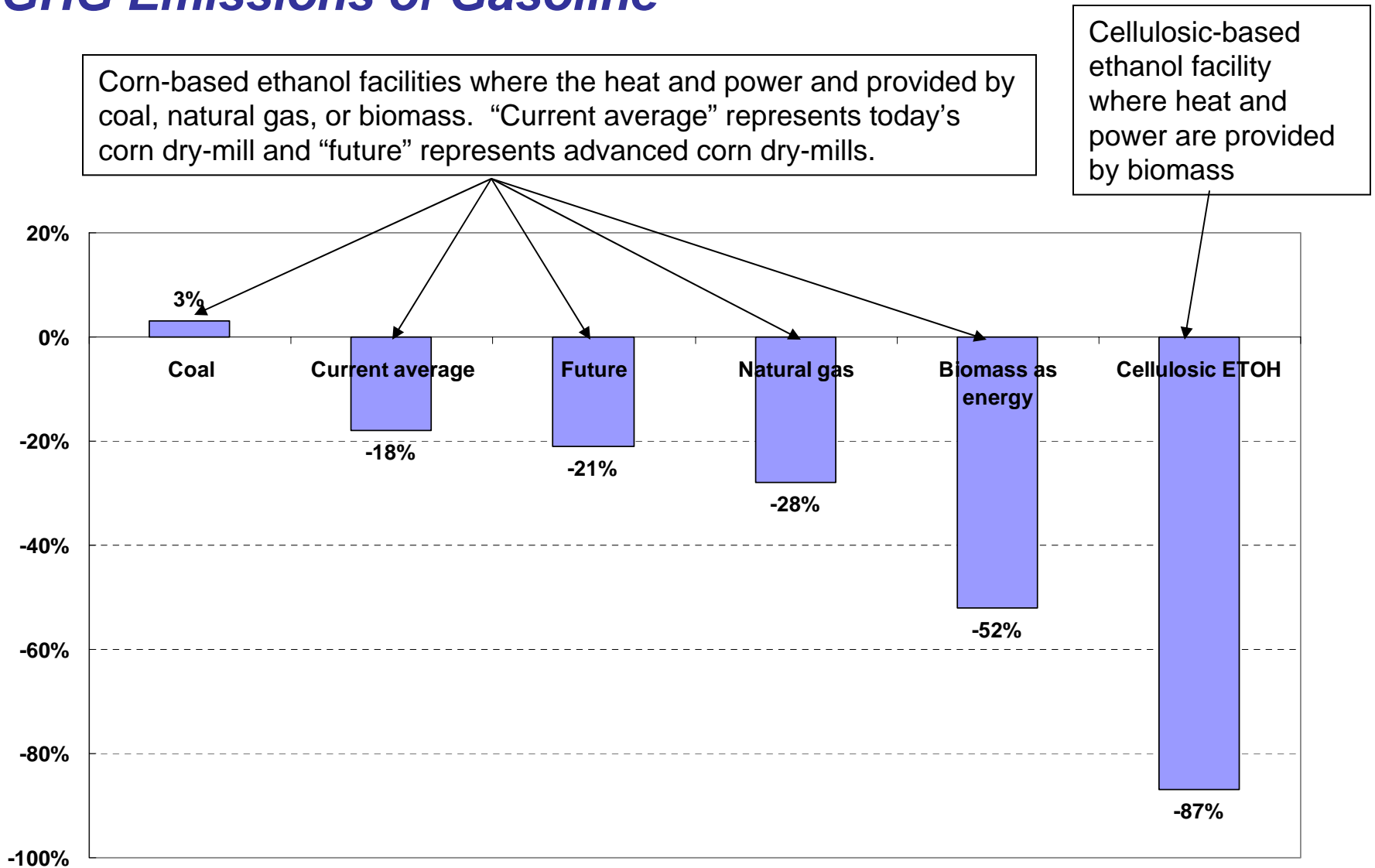
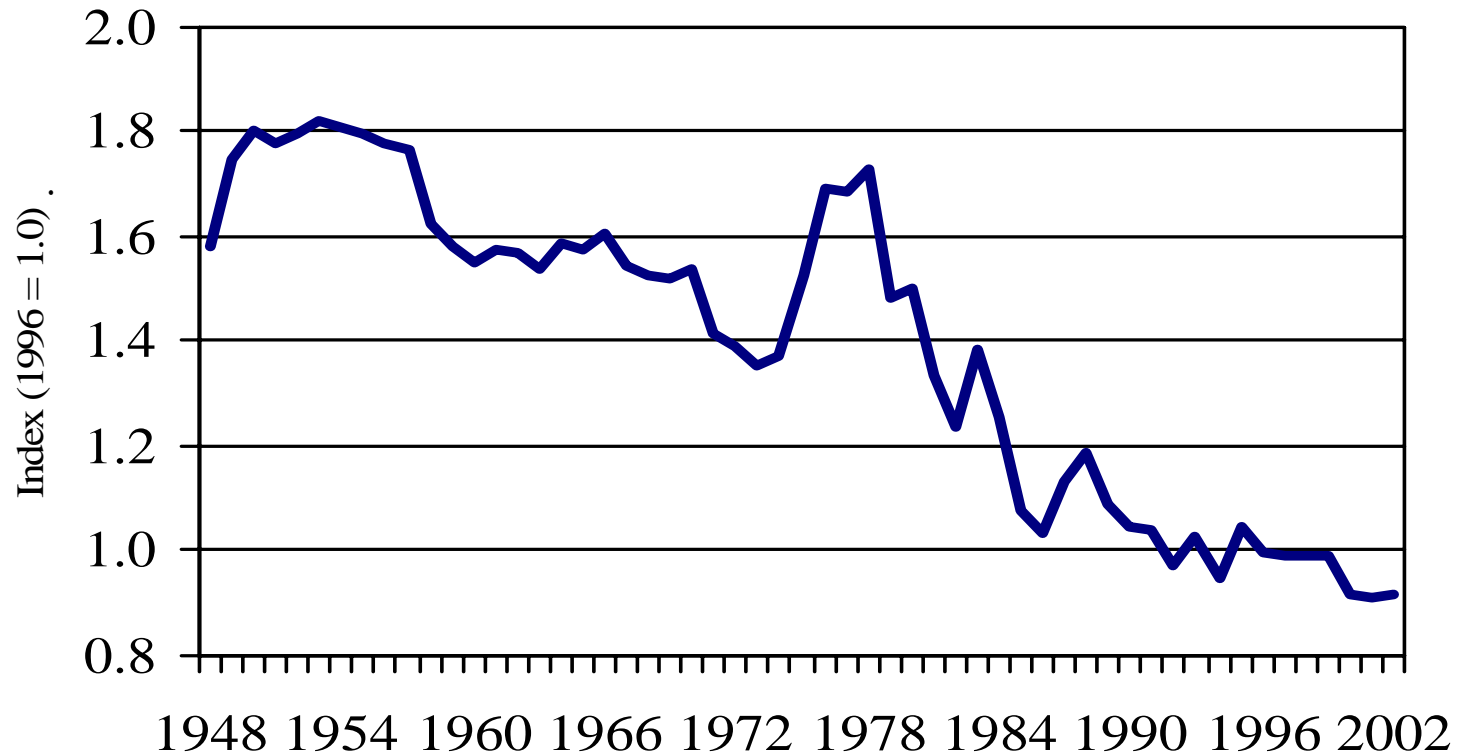


GHG Emission Changes by Corn Ethanol Relative to GHG Emissions of Gasoline



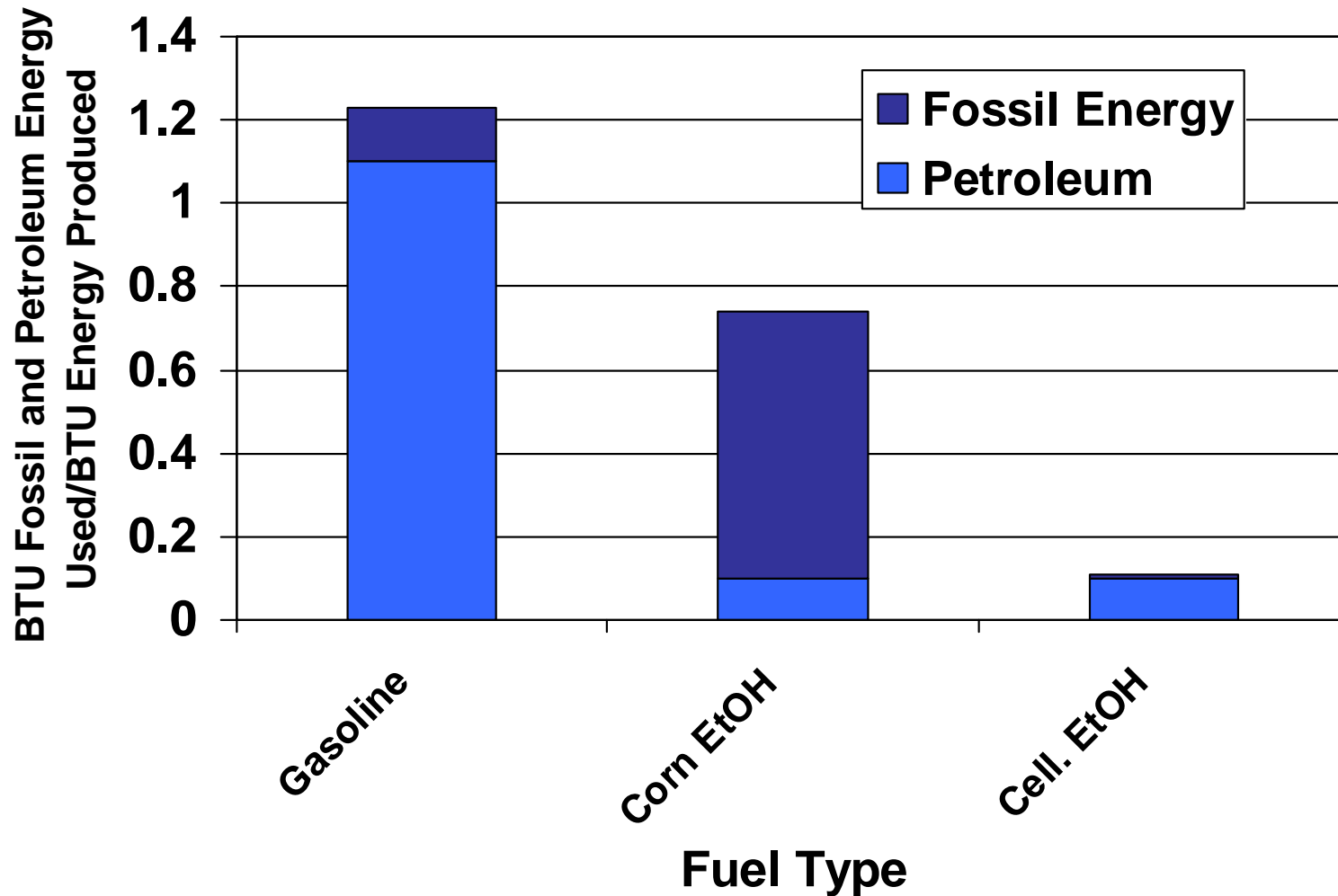
Source: M. Wang, Argonne National Laboratory

Energy Use Per Unit of Farm Output Has Fallen Over the Last 50 Years

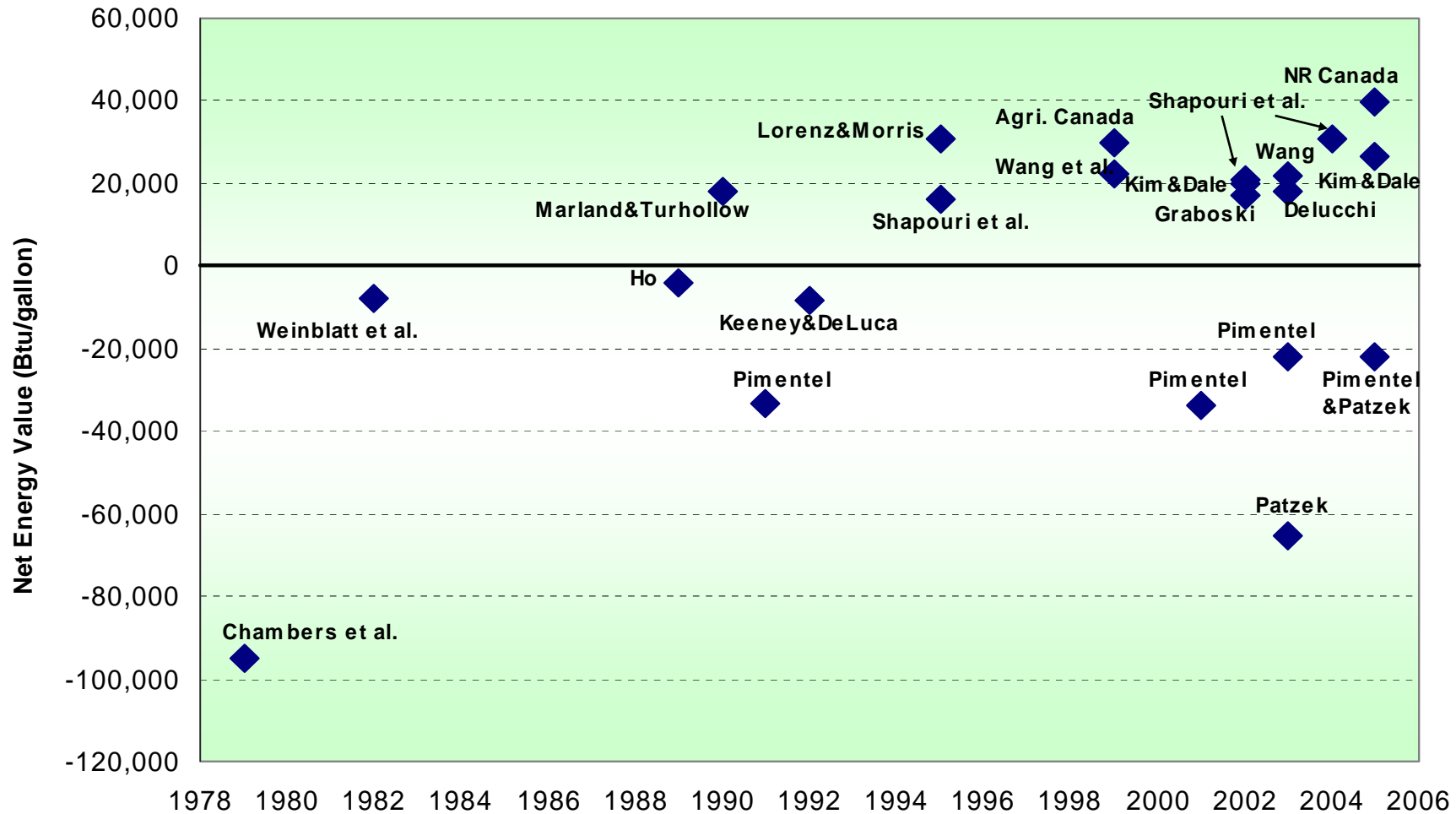


Source: USDA, 2007 Farm Bill Theme Papers, Chapter 4, Energy and Agriculture, pp. 85 - 86

Total BTU of Fossil and Petroleum Energy Required to Produce 1 BTU of Gasoline and EtOH Available at the Pump



Most Recent Studies Show Positive Net Energy Balance for Corn Ethanol



- Energy balance here is defined as Btu content a gallon of ethanol minus fossil energy used to produce a gallon of ethanol
- For additional information: Alexander E. Farrell, et. Al., "Ethanol Can Contribute to Energy and Environmental Goals", **Science**, Volume 311, January 27, 2006, at <http://www.sciencemag.org>

Summary

- Corn derived ethanol requires only about 60% of the fossil energy required to deliver a gallon of liquid transportation fuel on an energy equivalent basis compared to gasoline.
- The fossil energy savings for corn derived ethanol continues to improve with improved agronomic practices, increased yields, improved nitrogen/water utilization, and improved conversion technology.
- Cellulosic derived ethanol requires only 40% of the fossil energy required to deliver a gallon of liquid transportation fuel on an energy equivalent basis compared to gasoline.
- Corn derived ethanol has the potential to reduce greenhouse gas emissions by 15-26% over petroleum based fuels.
- Cellulosic ethanol has the potential to reduce greenhouse gas emissions by as much as 87%.