

# Getting the Most Out of Biogas – Biogas Derived Transportation Fuels

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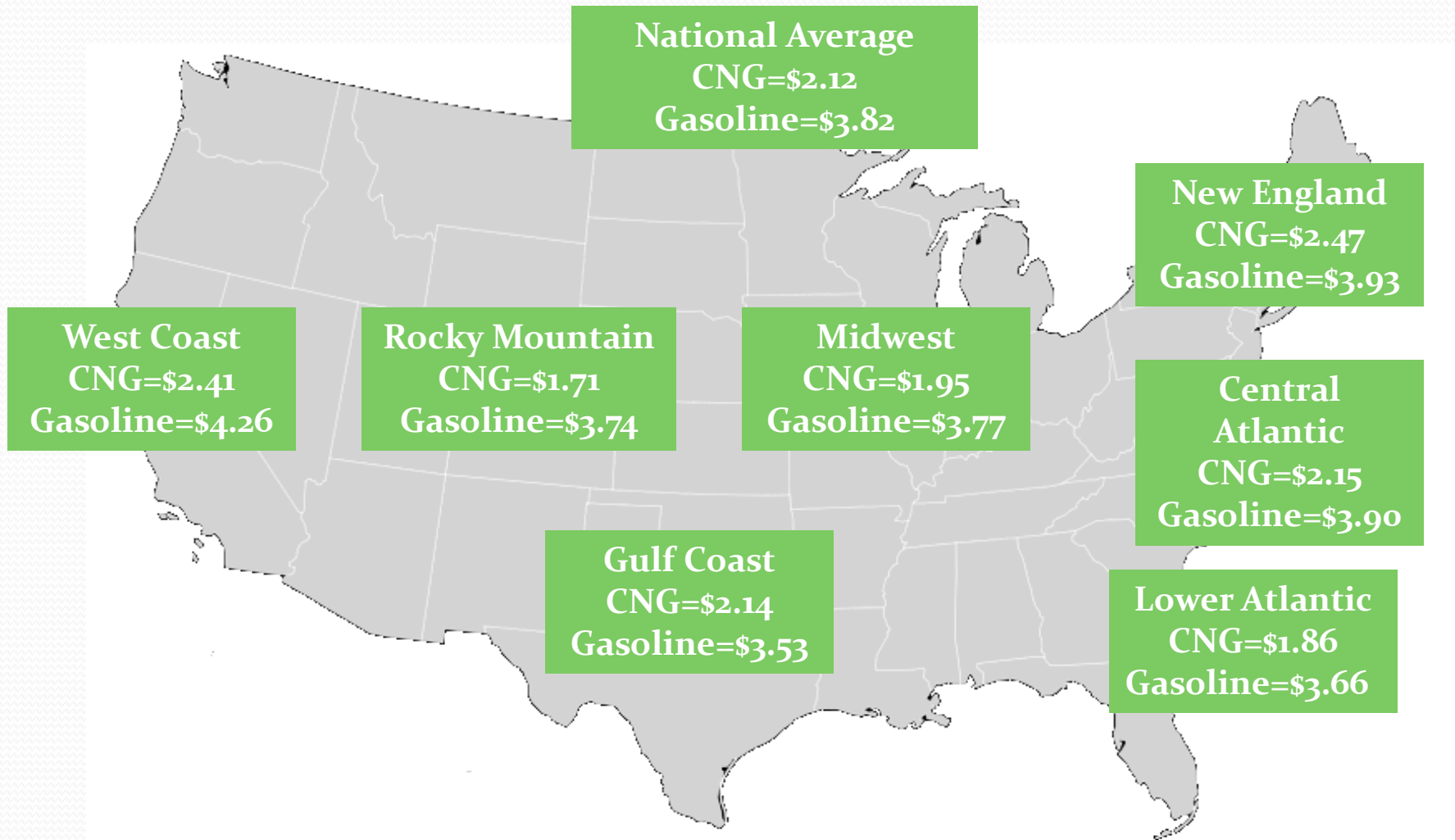


United States Environmental Protection Agency



# Retail Fuel Prices as of Fall 2013

(on energy equivalent basis)

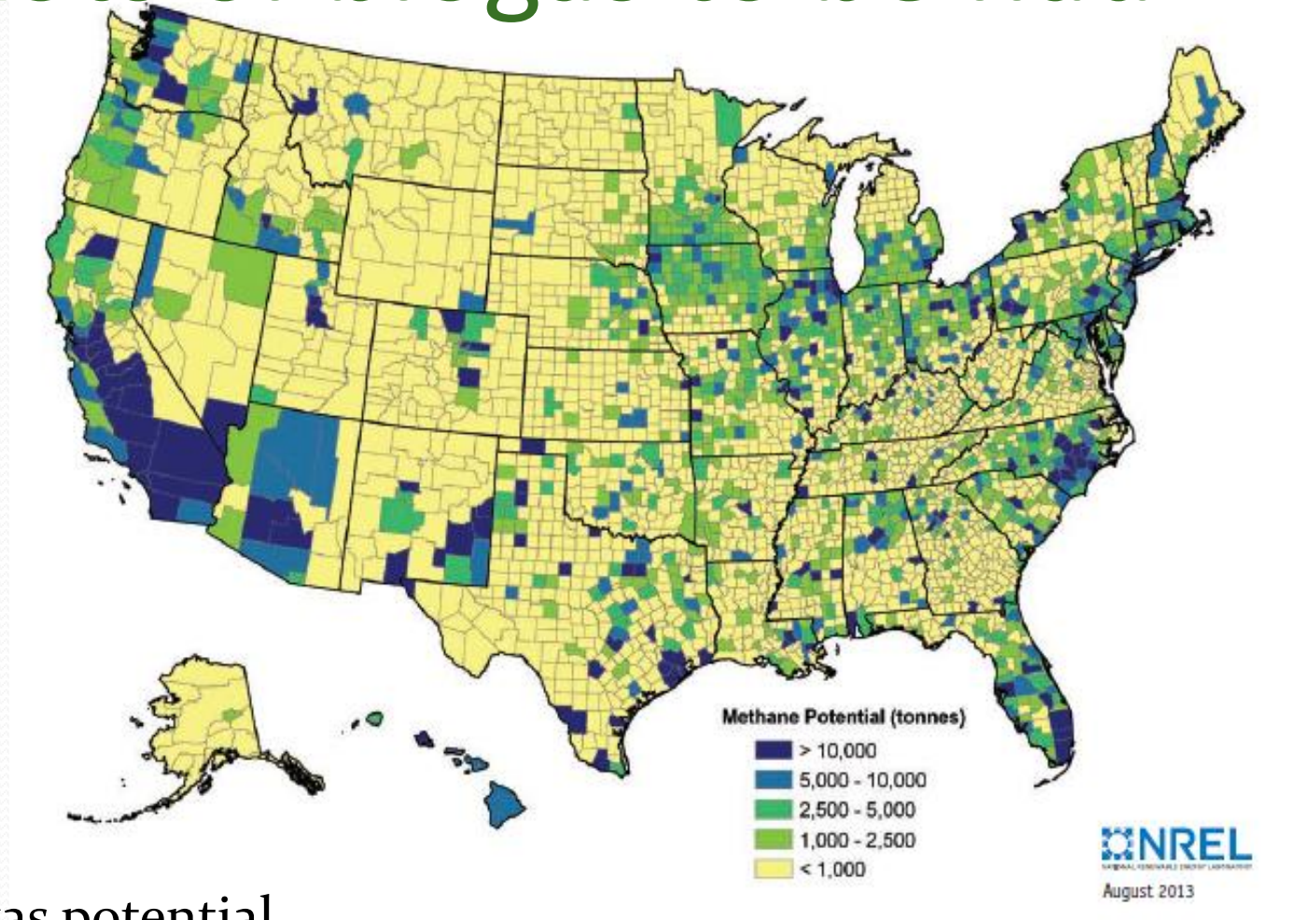


# Trans. Sector Biogas Trends

- More adoption of CNG/LNG vehicles
  - 60% of trash trucks sold in 2013 were NG trucks
  - By 2017 33% of Class 8 heavy duty trucks
- Environmental attributes and demand are increasing the value of biogas

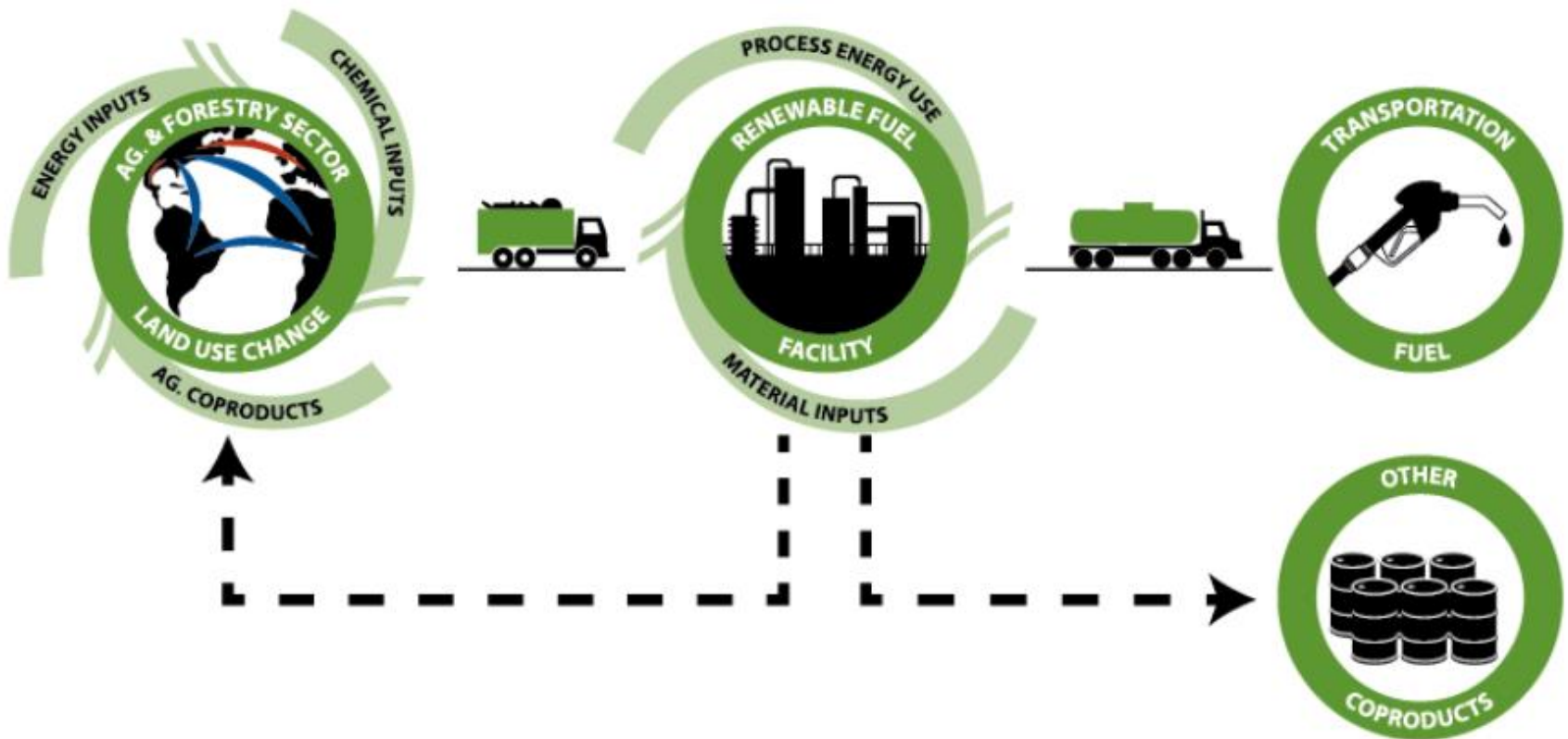


# Lots of biogas to be had



- Biogas potential
  - 7.9 million metric tons per year
  - If all of this was converted to CNG/LNG and used in the transportation sector it would represent ~5 Billion RINs

# Waste derived fuels are low-carbon fuels

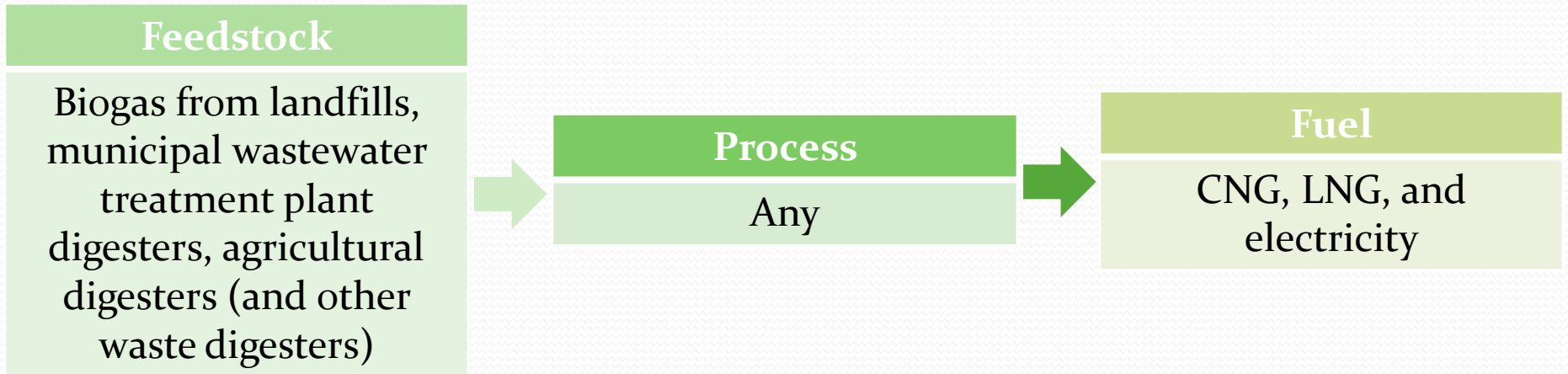


# Methane is more efficient and renewable natural gas is even better



- California Low Carbon Fuel Standard (LCFS) GHG emissions calculations (g/MJ)

# The Pathways are There



- An approved “pathway” consists of the unique combination of an approved feedstock, conversion process, and fuel
- For any approved feedstock there may be many approved conversion processes and approved fuels associated with it

# The Value Proposition for Transportation Fuels is Clear

- Average electric power price for NG in 2014 has been \$5.07 per thousand cubic feet

