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# CAPTURING INNOVATION IN BIOFUEL LIFE CYCLE ANALYSIS

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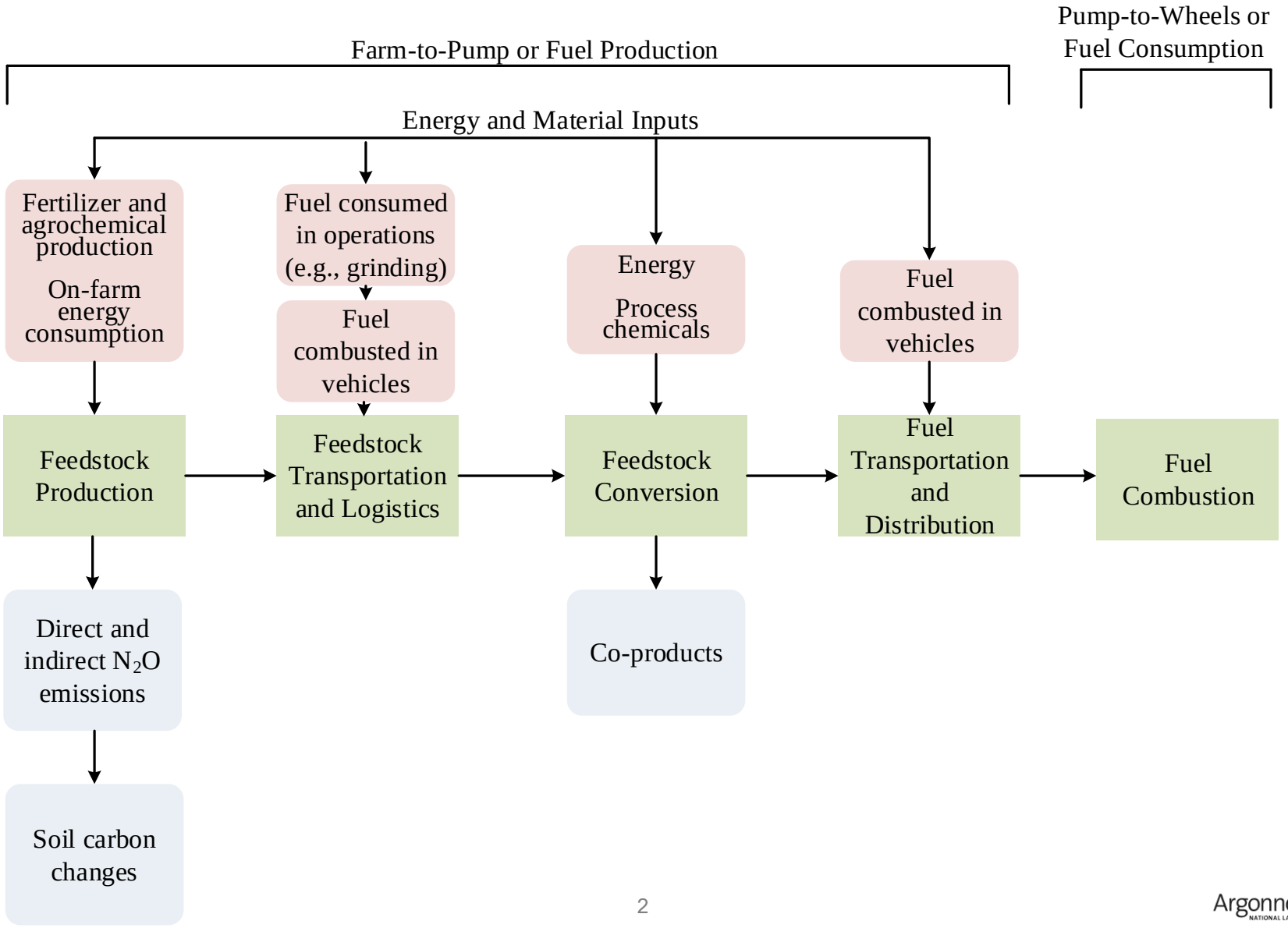
# SUPPLY CHAIN AND LIFE CYCLE ANALYSIS



# SOIL CARBON CHANGE UPON LAND TRANSITIONS DEPENDS ON MANY FACTORS

- Land use history
- Yield
- Climate
- Soil depth
- Management practices
  - Manure application
  - Cover crop adoption

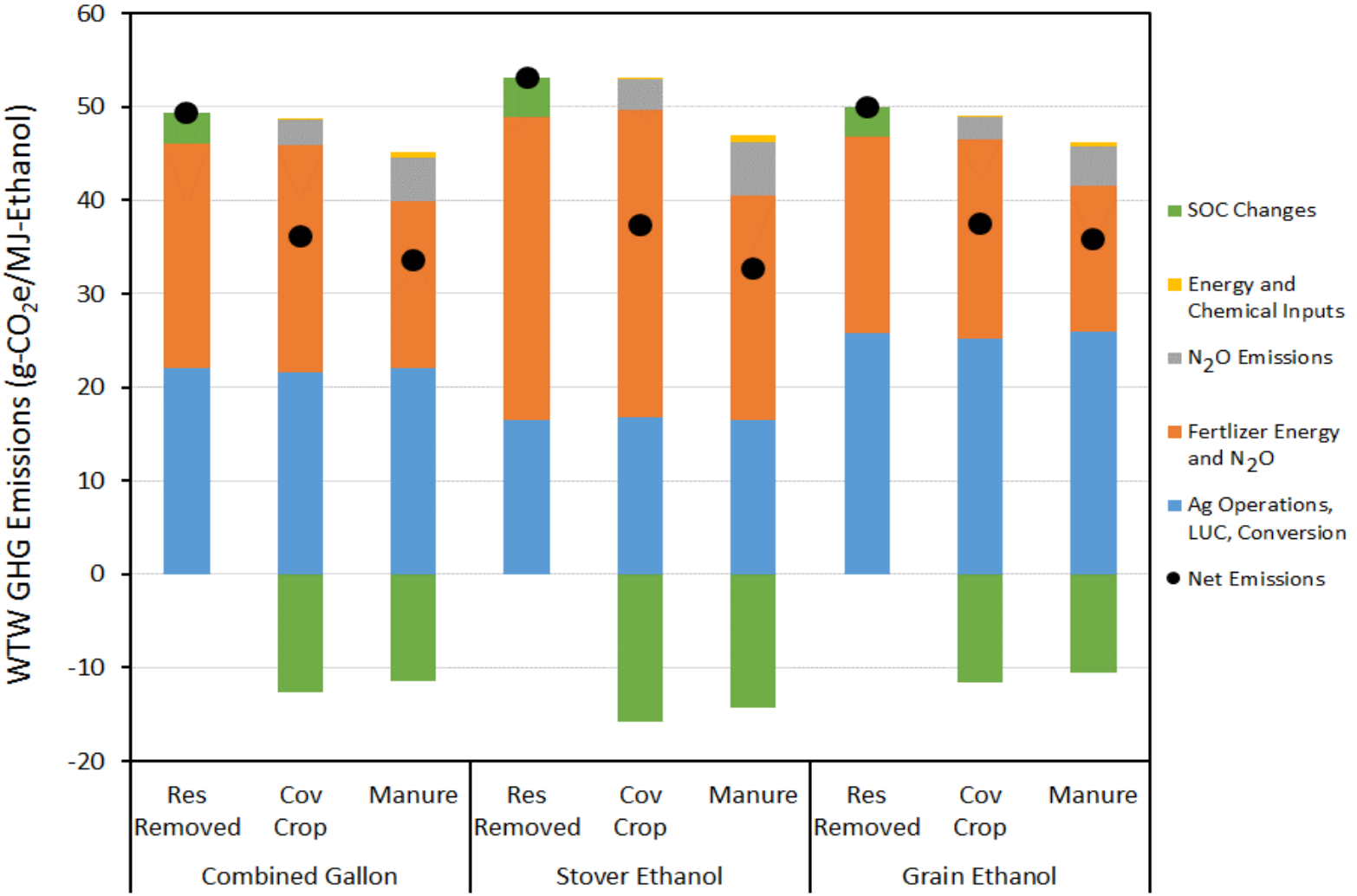
Credit: P.F. Dunn

Credit: National Renewable Energy Laboratory

Credit: P.F. Dunn

Credit: Ken Goddard

# LAND MANAGEMENT PRACTICES INFLUENCE BIOFUEL LIFE-CYCLE GHG EMISSIONS



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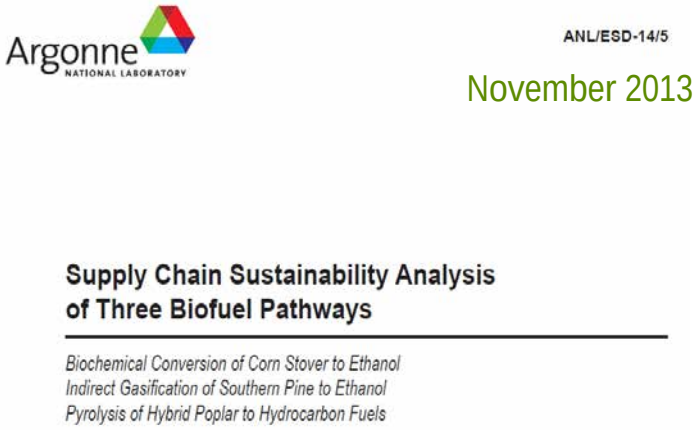
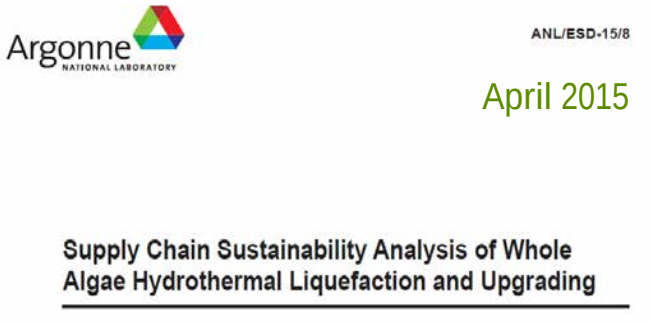
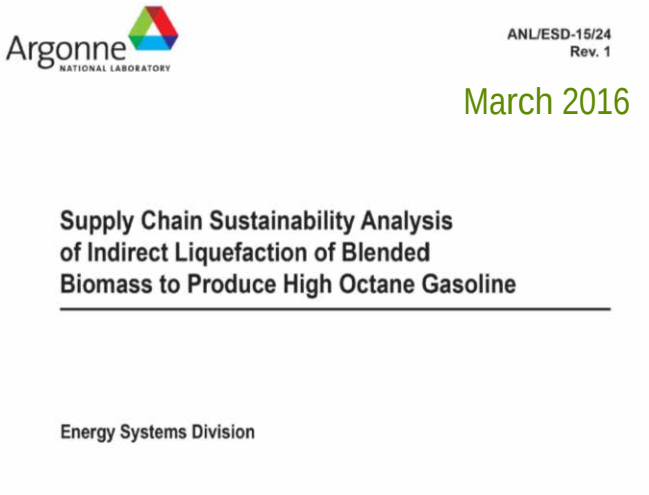
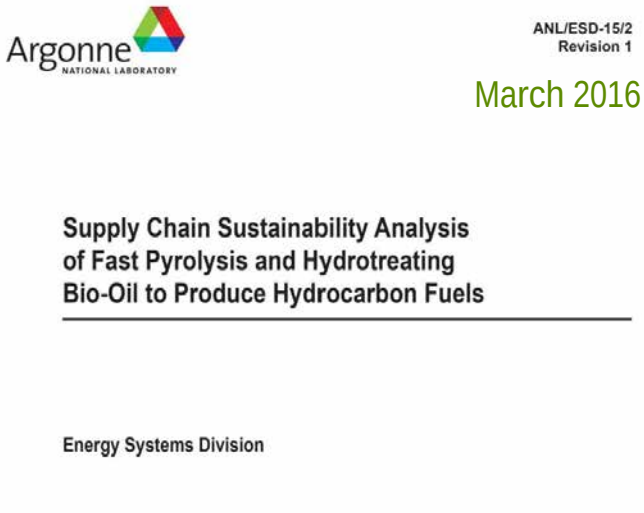
# CAPTURING INNOVATION IN CONVERSION THROUGH SUPPLY CHAIN SUSTAINABILITY ANALYSES

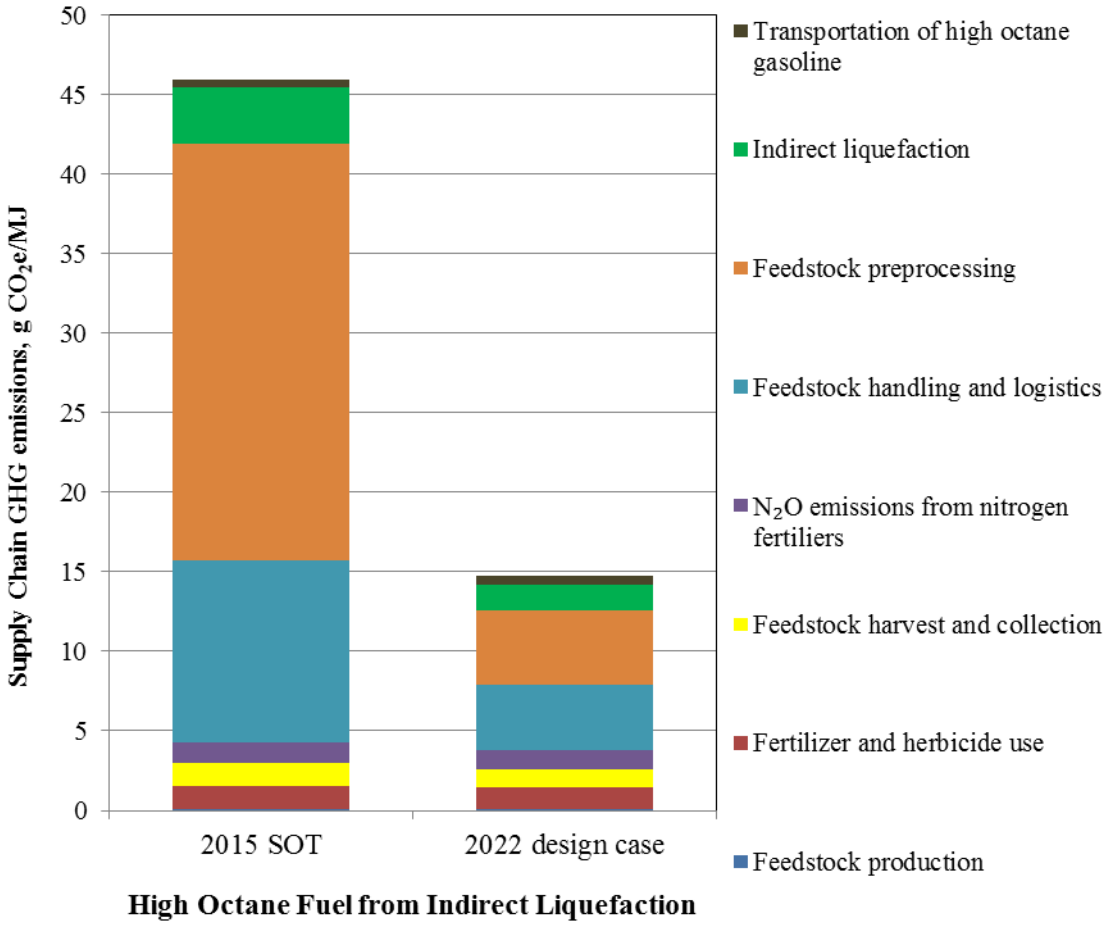


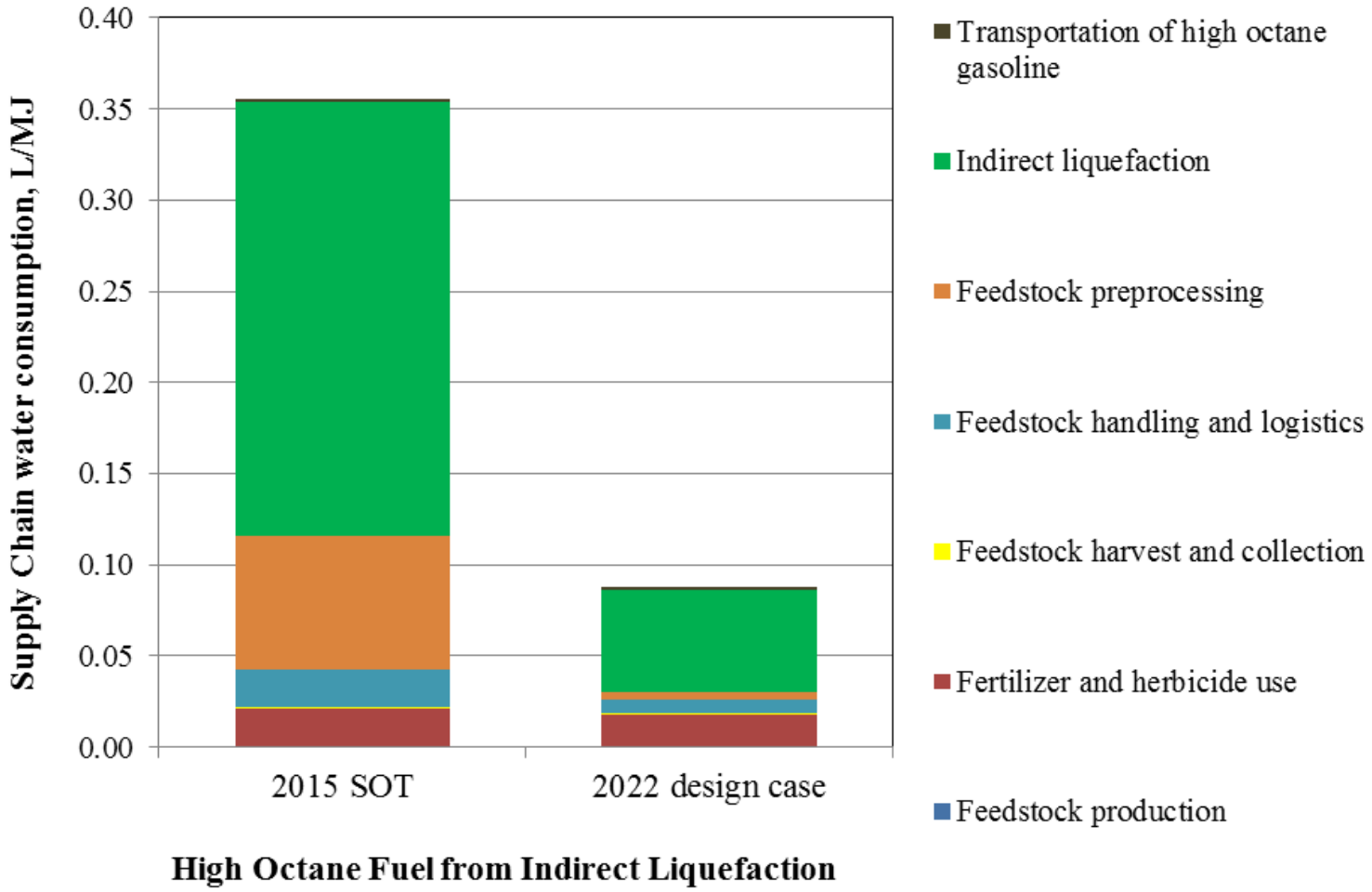
# CAPTURING INNOVATION THROUGH SCSA: *GHG EMISSIONS*






Petroleum baseline: 93.2 g $CO_2$e/MJ

# CAPTURING INNOVATION THROUGH SCSA: *WATER CONSUMPTION*




Petroleum baseline: 0.14 L/MJ

# KEY ISSUES IN QUANTIFYING ENVIRONMENTAL BENEFITS OF THE BIOECONOMY

- Data quality
- May rely on models, engineering calculations when data unavailable
- Allocating burdens among co-products
- Defining the business as usual case
- Communicating results transparently

Credit: J. B. Dunn

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