

*the Energy to Lead*

# Bio-fuels moving forward

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# The Past and Present

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- > Ethanol
- > Bio-diesel
- > Bio-gas

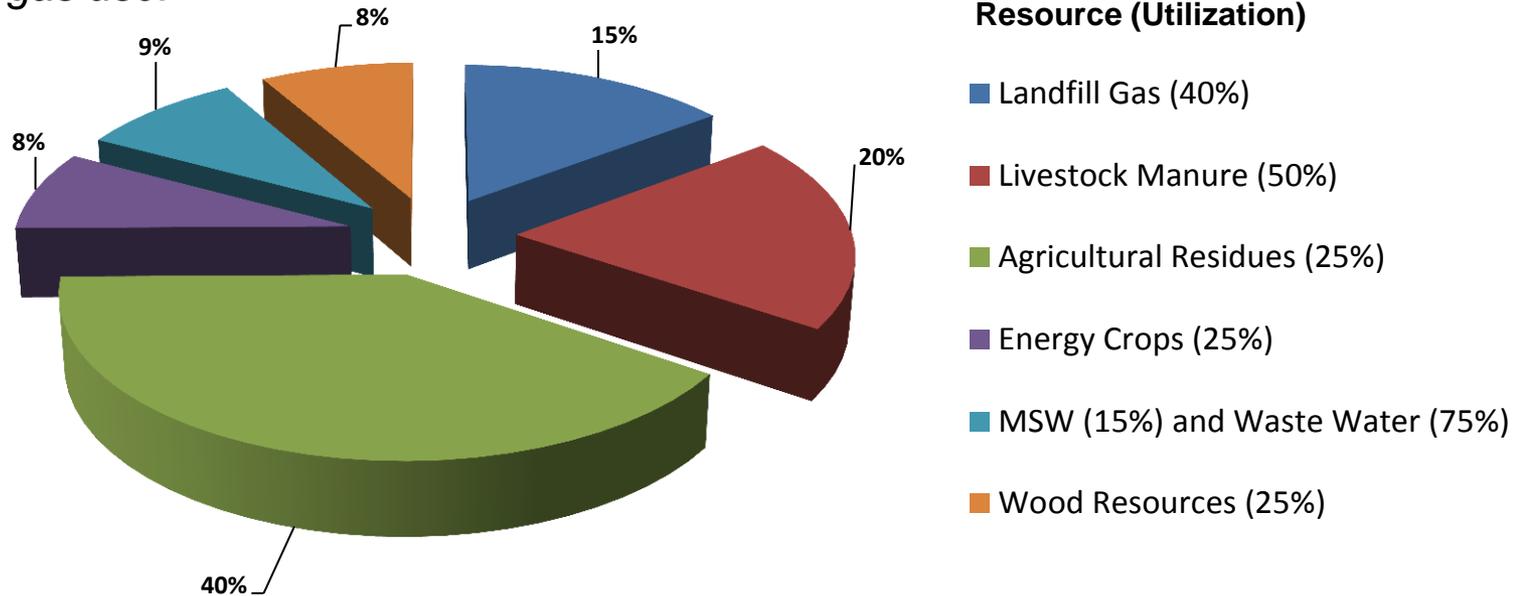
# The Present and Future

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- > Renewable Gasoline
- > Renewable Diesel
- > Renewable Natural Gas

# Summary of Resource Potential: AGF Renewable Bio-gas Study

Total potential bio-gas: 2485 Bcf  
Total 2010 natural gas use:  
24,450 Bcf



References:  
"Energy Projects and Candidate Landfills", Landfill Methane Outreach Program, available at <http://www.epa.gov/lmop/projects-candidates/index.html>, retrieved Oct 2010  
Agricultural Statistics Annual, National Agricultural Statistics Service, available at [http://www.nass.usda.gov/Publications/Ag\\_Statistics/2009/](http://www.nass.usda.gov/Publications/Ag_Statistics/2009/), (2009) site data last modified July 15, 2010  
Equine, USDA, National Agricultural Statistics Service, available at <http://usda.mannlib.cornell.edu/usda/nass/Equine/equi1999.txt>, retrieved September 2010  
A Geographic Perspective on the Current Biomass Resource Availability in the United States, A. Milbrandt, NREL/TP-560-39181, Dec 2005

# Small-Scale Liquefaction

World's largest landfill gas to LNG facility  
Linde-Waste Management Altamont Landfill  
in California (13,000 LNG gallons per day)



Remote gas recovery and use for  
LNG vehicles (Tasmania, Australia)



- > GTI-licensed small-scale liquefaction technology
- > Being deployed by Linde at stranded gas and bio-methane facilities around the world
- > Potential application for natural gas E&P operations
- > Running vehicles, pumps, compressors, generators using LNG in lieu of diesel



# Change in State incentives

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## > Past and Present

- Blender pumps
- Tax breaks and grants to build ethanol and bio-diesel facilities

## > What is needed now and in the future

- Incentives to stabilize long term production and purchase price of feedstock resources – focusing on each State’s resources
- Policies to move renewable natural gas by contract through the pipelines to fleets for RNG and electricity producers to meet State RPS mandates
- Tax incentives/grants/loans to build production facilities including “drop in fuel” production.

# GTI contact information

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