



# Intro to RNG for Utilities

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# Resources: Gas Purity Recommendation



Physical Property	Units	Lower Limit	Upper Limit
Heating Value	BTU/ft3	960	1100
Carbon Dioxide	mol %		2
Oxygen	mol %		0.4
Total Inerts	mol %		5
Hydrogen Sulfide	gr./100 ft3		1/4
Total Sulfur	gr./100 ft3		1
Water	lbs/mmSft3		7
Siloxanes	ppm(v)		1
Hydrocarbon Dew Point	Fahrenheit		-40
Temperature	Fahrenheit	50	120
Dust, Particulate			commercially free*
Biologicals			commercially free*
Heavy Metals			commercially free*

\*Commercially free is defined as equal or less than the levels present in conventional natural gas



# Resources: RNG Interconnection Guide

- Northeast Gas Association/GTI/National Grid: “Interconnect Guide for Renewable Natural Gas (RNG) in New York State”
- <https://www.nationalgridus.com/media/pronet/nga-interconnect-guide-for-rng-in-nys.pdf>

Parameter	Landfill	Agricultural and Clean Organics	WWTP	Source Separated Organics and Facility Separated Organics <sup>21</sup>	Gasifier, Syngas
Water Content <sup>22</sup>					
Sulfur, including Hydrogen Sulfide					
Hydrogen					
Carbon dioxide					
Nitrogen					
Oxygen					
Ammonia					
Biologicals (bacteria or spores $\leq 0.2$ micron)					
Mercury					
Volatile metals					
Siloxanes					
Volatile Organic Compounds					
Semi-volatile Organic Compounds					
Halocarbons					
Aldehydes and Ketones					
Polychlorinated biphenyls (PCBs) <sup>(23)</sup>					
Pesticides <sup>(11)</sup>					



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[www.americanbiogasCouncil.org](http://www.americanbiogasCouncil.org)

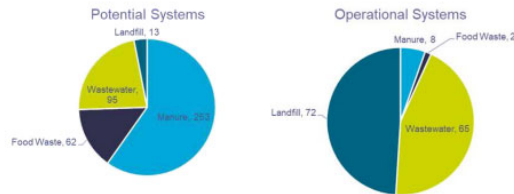
# What's the biogas/RNG potential in your state?



## MICHIGAN BIOGAS STATE PROFILE



Michigan ranks **15<sup>th</sup>** out of 50 states for its biogas production potential. We estimate up to 32.37 billion cubic feet of renewable methane from biogas could be produced each year for energy, fuel, heat, and more!



- <https://americanbiogasCouncil.org/resources/state-profiles/>

## THE POWER OF 50.58 BILLION CUFT OF BIOGAS:

### ENERGY POTENTIAL:

- **2710 million kWh** electricity and **1056 million BTU/h** heat (engine); OR
- **4533 million kWh** electricity and **7556 million kWh** heat (fuel cell); OR
- **420.4 million gge** fuel; OR
- **239 million kWh** heat.

### ECONOMIC GROWTH:

Constructing 423 new systems would generate about...

- **\$1.27 billion** in capital investments,
- **10565** construction jobs, AND
- **701** permanent jobs.

### REDUCE GREENHOUSE GAS EMISSIONS EQUIVALENT TO:

- Growing **1428 million** coniferous tree seedlings for 10 yrs, OR
- Replacing **197800** acres of forest, OR
- Removing **3.19 million** cars from the road.

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