

Biogas State Profile: North Carolina

Biogas Potential

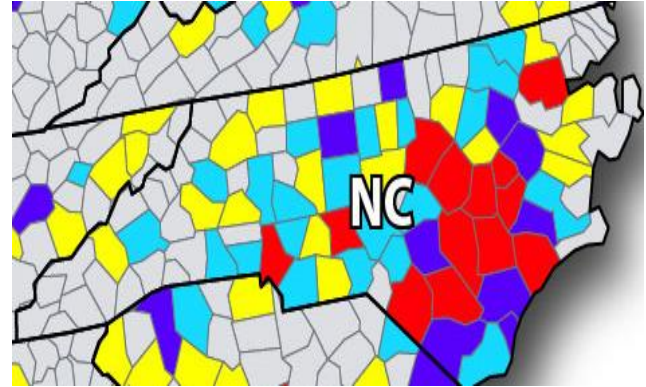
North Carolina ranks #3 among U.S. states for methane production potential from biogas sources.¹

Currently North Carolina has 75 operational biogas systems. We see the potential for more than 899 new projects to be developed based on the estimated amount of available organic material.

Constructing this many projects would generate \$2.7 billion in capital investment, and create 22,475 short-term construction jobs, 1,798 long-term jobs, and numerous industry-supporting jobs.

If fully realized, these biogas systems could produce enough electricity to power 497,523 homes (5.6 billion kWh) or enough renewable natural gas to fuel 64,466 vehicles.

They would also collectively reduce greenhouse gas emissions by the equivalent of 14.9 trillion tons of carbon dioxide, the same as growing 102 million tree seedlings for ten years or the amount 3,400,937 million acres of U.S. American forest sequester each year.²



This analysis illustrates the methane generation potential by county from the following biogas sources: landfills; animal manure; wastewater treatment; and industrial, institutional, and commercial organic waste (IIC).

Thousand Tonnes/Year

- > 10
- 5 to 10
- 2.5 to 5
- 1 to 2.5
- < 1

U.S. Energy Rankings

| Energy | |
|--|--|
| Total CO2 Emissions ¹² | Ranks 14 th in U.S., 2.8% share |
| Per Capita Energy Consumption ¹³ | Ranks 38 th in U.S. |
| Renewable Electricity Generation ¹⁴ | Ranks 13 th in U.S. |
| Energy Prices Rank ¹⁵ | Ranks 32 nd in U.S. |

Biogas Systems

Food Waste

| | |
|--|----|
| Operational food waste biogas systems ³ | - |
| Potential food waste biogas systems ⁴ | 22 |

Agriculture

| | |
|--|-----|
| Operational biogas systems on farms ⁵ | 10 |
| Potential dairy farm biogas systems ⁶ | 175 |
| Potential swine farm biogas systems ⁷ | 529 |

Waste Water

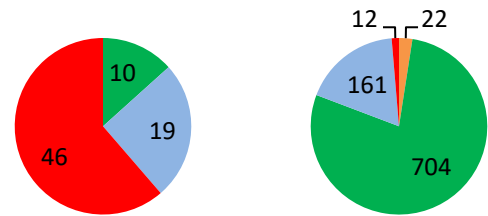
| | |
|---|-----|
| Operational biogas systems at water resource recovery facilities ⁸ | 19 |
| Potential biogas systems at WRRFS ⁹ | 161 |

Landfills

| | |
|--|----|
| Operational landfill gas systems ¹⁰ | 46 |
| Potential landfill gas systems ¹¹ | 12 |

Operational Systems

Potential Systems



■ Food Waste ■ Agriculture ■ Waste Water ■ Landfill

Feedstocks

Manure

| | |
|------------------------------------|-------------------------------|
| Total Manure Volume ¹⁶ | 144.1 million gallons per day |
| Total Dairy Manure ¹⁷ | 846 thousand gallons per day |
| Total Swine Manure ¹⁸ | 13.2 million gallons per day |
| Total Broiler Manure ¹⁹ | 119.2 million gallons per day |
| Total Turkey manure ²⁰ | 7.1 million gallons per day |
| Total Beef Manure ²¹ | 4.0 million gallons per day |

Food Waste

| | |
|--|-------------------------|
| Total Food Waste Generated ²² | 1,093,840 tons per year |
|--|-------------------------|

Waste Water

| | |
|--|-----------------------------|
| Average flow from WRRF's ²³ | 9.6 million gallons per day |
|--|-----------------------------|

North Carolina Green Policies

Reduction of REPS: House Bill 681, titled "NC Energy Ratepayers Protection Act", seeks to repeal major sections of the REPS, and diminish the goals for future renewable energy development in NC. It also reduces the requirement for creating renewable energy from swine waste, which is typically being accomplished through AD and biogas systems.²⁴

Renewable Energy Investment Tax Credit: The House (HB 454) and Senate (SB 447) filed measures that seek to extend the current renewable energy tax credit for 2 years for all renewable energy technologies, and an additional 5 years for all renewable energy technologies.²⁵

| | |
|-----------------------------|--|
| State RPS ²⁶ | 12.5% (IOU's), 10% (co-ops and munis) by 2021, includes biogas. Carve outs for swine and poultry waste |
| Statutes & Regulations | NC Environmental Policy Act North Carolina Executive Order 156 Toxic Air Procedures Rules NC-Strategic Energy Plan Environmental Management Systems (EMS) Sustainable & Green Building Practices |
| Sustainability Commitments | NC Project Green; Clean Cities Coalition, City of Asheville – Building Standards NC State University University of North Carolina Appalachian State University Sustainable Raleigh U.S. Green Building Council-NC Chapter |
| State Funding Opportunities | Public Benefits Fund; Net Metering Southeastern Regional Biomass Energy Program Energy Improvement Loan Program Renewable Energy Tax Credit Section 319 Grants American Recovery and Reinvestment Act (ARRA)- NC State Energy Program Conservation of Energy and Water Use in State Buildings NC GreenPower Production Incentive Financing Program for Renewable Energy and Energy Efficiency Clean Energy Financing |

Biogas Companies Located in NC

[AAT America Inc](#)

[Butler Quality Pork & Green Energy Farm](#)

[Cavanaugh & Associates, P.A](#)

[Landia, Inc](#)

[R. Alexander Associates, Inc.](#)

[Xylem Water Solutions](#)

+ Dozens More

[Visit www.AmericanBiogasCouncil.org](http://www.AmericanBiogasCouncil.org) for the full Biogas Industry Directory

North Carolina Biogas Resources:

[North Carolina Waste Trader](#)

This waste exchange service is designed to divert recoverable materials from disposal while providing feedstocks and supplies to potential users.

[Food Waste Reduction Alliance](#)

Working collaboratively across sectors, the FWRA seeks to reduce the amount of food waste generated, increase the amount of safe, nutritious food donated to those in need, and recycle unavoidable food waste, diverting it from landfills.

[An Economic Evaluation of North Carolina's Landfill Biogas Development Potential](#)

Duke University has developed the OptimaBIOGAS tool to model the opportunities for and costs of developing, transporting, and generating usable energy from a variety of biogas sources.

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- 1 <http://www.nrel.gov/docs/fy14osti/60178.pdf>
- 2 (See ABC Biogas Potential Calculator)
- 3 (See ABC Food Waste Digester Excel Spreadsheet)
- 4 (See ABC Biogas Potential Calculator)
- 5 <http://epa.gov/agstar/projects/index.html>
- 6 http://www.agcensus.usda.gov/Publications/2012/Full_Report/Vol_1_State_Level/North_Carolina/st37_1_012_013.pdf (Farms with 500 to 999 milk cows)
- 7 http://www.agcensus.usda.gov/Publications/2012/Full_Report/Vol_1_State_Level/North_Carolina/st37_1_020_023.pdf (Farms with 5,000 or more hogs)
- 8 <http://resourcerecoverydata.org/>
- 9 (See Above)
- 10 <http://www.epa.gov/lmop/projects-candidates/operational.html>
- 11 <http://www.epa.gov/lmop/projects-candidates/candidates.html>
- 12 <http://www.eia.gov/state/rankings/?sid=CA#series/226>
- 13 <http://www.eia.gov/state/?sid=CA#tabs-5>
- 14 (See Above)
- 15 <http://www.eia.gov/state/rankings/#/series/31>
- 16 (See EQIP State Matrix Livestock Inventory)
- 17 (See Above)
- 18 (See Above)
- 19 (See Above)
- 20 (See Above)
- 21 (See Above)
- 22 (see ABC Biogas Potential Calculator)
- 23 <http://resourcerecoverydata.org/>
- 24 <https://legiscan.com/NC/bill/H681/2015>
- 25 <https://legiscan.com/NC/bill/H454/2015>
- 26 <http://programs.dsireusa.org/system/program/detail/2660>

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