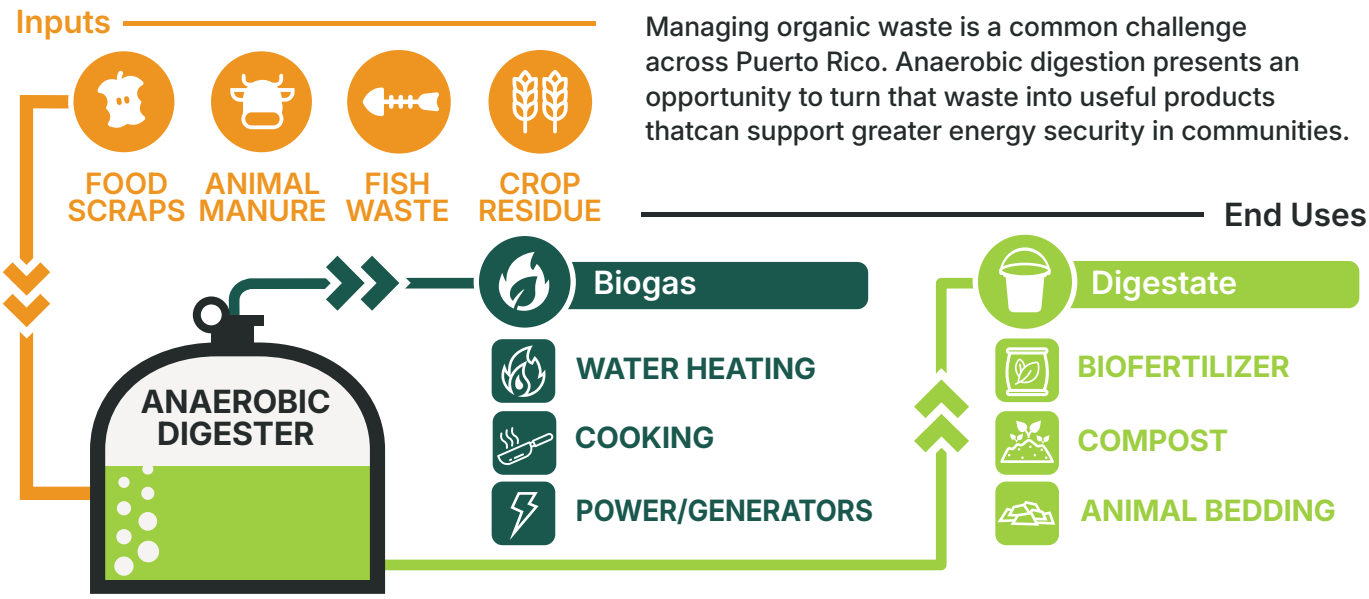
National Laboratory of the Rockies

# Biodigesters for Energy Security and Community Livelihoods in Puerto Rico

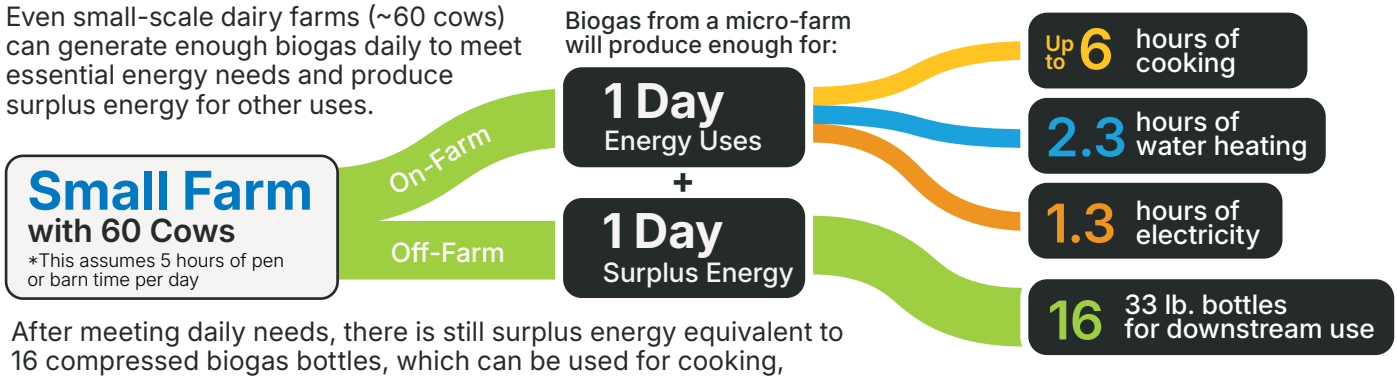
## Anaerobic Digestion - Waste to Benefits




Managing organic waste is a common challenge across Puerto Rico. Anaerobic digestion presents an opportunity to turn that waste into useful products thatcan support greater energy security in communities.

### Biogas Example Applications

Even small-scale dairy farms (~60 cows) can generate enough biogas daily to meet essential energy needs and produce surplus energy for other uses.




After meeting daily needs, there is still surplus energy equivalent to 16 compressed biogas bottles, which can be used for cooking, backup energy, or other downstream uses.

### Effective Biodigester Design

**SIMPLE** Biodigesters can be developed using readily available local materials with limited time and labor. Only simple training is needed to operate these systems.

**SAFE** With effective training for users and intentional design, biodigesters can minimize risk and provide safe, reliable operations in alignment with local laws and regulations.

**FLEXIBLE** Biodigesters can be designed to best suit individual sites using a variety of organic waste streams to produce biogas and digestate for a wide range of end-use applications.

Learn more in the Communities LEAP case study, "Anaerobic Digestion in Puerto Rico: Examples and Opportunities for Farms and Communities," available at: nlr.gov/docs/fy26osti/95079.pdf.

# Benefits of Anaerobic Digestion

## Scaling anaerobic digestion can provide these benefits:

### 1. Reliable Energy Access

Provides reliable cooking, heating, and power during service disruptions.

### 2. Local Livelihoods

Potential to generate up to 4 new jobs per micro-digester and strengthen farmer incomes, contributing to rural economic development.*

### 3. Waste Management

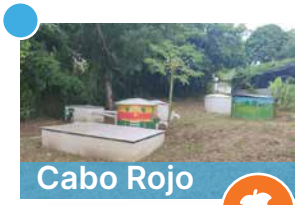
Improves handling of agricultural waste which can reduce runoff, protect water quality, and support public health.

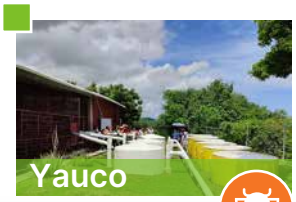
### 4. Cleaner Air

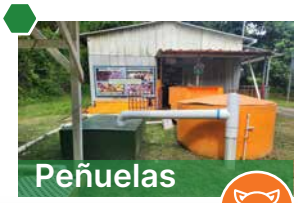
Minimizes strong odors and harmful gases from animal waste, improving air quality for farmers and surrounding communities.

*Based on performance at current CMTAS sites

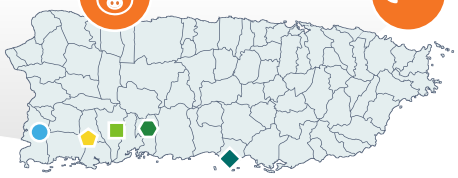
# CMTAS Operations and Impact





CMTAS currently has 5 sites in Puerto Rico with 8 anaerobic digesters installed utilizing a variety of feedstocks – from livestock and fisheries to community food waste.



**8** Digesters

**6+ tons** of Biogas Annually

**350+** People Trained

**Up to 4** Jobs per Site

The Center for Microenterprises and Sustainable Agricultural Technologies of Yauco (CMTAS), with support from the Hispanic Federation, is a nonprofit organization operating in Puerto Rico for more than 15 years.

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**LEARN**
Workshops, ecotourism and educational visits

**INVESTIGATE**
"Living lab" for research partnerships

**DEPLOY**
Training and deployment for new biogas sites

*Photos from: Pablo E. Guzmán López, CMTAS Project Director; Wanda Santiago Torres, CMTAS Director; and Daniella Rough, NLR.*

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The National Laboratory of the Rockies is a national laboratory of the U.S. Department of Energy, Office of Critical Minerals and Energy Innovation, operated under Contract No. DE-AC36-08GO28308.

NLR/FS-6A20-95078 • September 2026