



The Digester is in the lower left of this photo on the 2400 acre spread of the Goodrich Family Farm.

The Largest Anaerobic Digester in the Northeast Starts Producing RNG

In the rolling hills of Vermont, the 2,400-acre, fourth-generation Goodrich Family Farm is home to 900 cows whose milk is sold to the Agri-Mark dairy cooperative for local cheese production. But now it is home to more!

The largest anaerobic digester in the Northeast has just gone into operation there as well. The project is producing renewable natural gas (RNG) from cow manure and food waste that will provide additional revenue to the farm and help a college campus achieve its 100% renewable energy target.

The Goodrich Family Farm, located in Salisbury, Vermont, in partnership with Vanguard Renewables and Vermont Gas Systems, developed the facility which can process 100 tons of dairy manure from the farm's 900 cows plus more than 180 tons of food scraps and beverage waste from local businesses every day, including Ben and Jerry's, Cabot Creamery, Whistlepig Distillery and Switchback Brewing Company.

The digester is owned and operated by Vanguard Renewables. It is the company's first in Vermont. This project also marks the first time that Vanguard is supplying a college with RNG. About 55% of the RNG generated by the digester

will be purchased by Middlebury College as part of its Energy2028 plan that commits the college to achieve 100% renewable energy use by 2028. The rest will be made available to Vermont residents who want to reduce their carbon footprints at an additional cost.

Alex DePillis, Senior Agricultural Development Coordinator at Vermont Agency of Agriculture, Food, and Markets, credited the partners for working tirelessly to see it come to fruition and recognized the myriad benefits the project can reap. In addition to fuel production, these include: 1) job creation as the facility requires a local operations workforce, 2) production of nutrient-rich organic fertilizers replacing chemical fertilizers for the farm, 3) use of residual solids for cow bedding, 4) preventing farm runoff from polluting Lake Champlain, 5) creating a model for other farms, food waste businesses, municipalities, and states to follow, and finally, 6) providing opportunities for local research and student projects on food systems, circular economy and clean energy/fuels.

Vanguard Renewables was a 2020 Energy Vision Leadership Award winner for its work with America's farmers, food and beverage manufacturers, food retailers, and other institutions to collect food waste and combine it with dairy

manure in anaerobic digesters to be converted to RNG for use as electricity and vehicle fuel. Vanguard was also recognized for this plan to help Middlebury College become a carbon-neutral campus, and it received a 2021 Dairy Sus-

tainability Award, where the Goodrich Farm project was recognized for its socially responsible, economically viable, and environmentally sound practices and technologies.

Letter From The Founder

By Joanna Underwood



The most recent report of the Intergovernmental Panel on Climate Change (IPCC) by the world's leading climate scientists has reinforced what every human living on this earth is now seeing with his or her own eyes: the horrors of a planet whose warming has unleashed massive wildfires, heatwaves, floods, droughts, and the melting of our planet's polar ice caps.

Think Globally, Act Locally – Turning Off the Methane Tap

The new report now calls methane a more insidious culprit than CO₂, since it has a warming potential in the next two decades that is more than 86 times greater. Biden and the US Congress have recognized this as well. Only by slashing methane gases by 45% in the coming decade can we avoid the most calamitous impacts of global warming.

Where has all this methane come from? About 40% is from fossil fuel operations, including abandoned oil and gas wells. But, as Energy Vision reported in its recent Op-Ed published in *The Hill*, more than 50% of human-caused methane emissions in the US are not from fossil fuel use. They are from agriculture and waste management/disposal activities, especially decomposing organic wastes: in landfills, food wastes from communities and food production facilities, agricultural manures, and more.

Energy Vision homed in on the methane problem a decade ago and has become the independent sector leader in showing business and government officials how organic methane biogases can be captured in airless tanks called anaerobic digesters. This keeps them from escaping into the air as potent climate warmers. The biogases can then be refined into "renewable natural gas" (RNG) fuel, which can be used in any ways fossil natural gas is used today – to generate power, to heat buildings, or, best of all, to displace diesel fuel in heavy-duty trucks and buses, cutting not only their greenhouse gases but also their health-damaging emissions.

This EV News reports on the largest anaerobic digester project in the northeast, where methane biogases from manure on the Goodrich Family Farm and local Vermont food wastes are converted into RNG. Most of the fuel is

helping Middlebury College meet its sustainability goal, and the high-quality fertilizer made from the organic bio-solids will help replace chemical fertilizers on farmlands. We also report on projects capturing methane biogases to generate fuel from four municipal wastewater plants in Colorado, where we ran that state's first state-wide "power of waste" workshop in 2016. These four plants are eliminating fugitive methane emissions and displacing over a million gallons of diesel vehicle fuel per year.

Right now, every urban and rural community has the exciting and economically viable opportunity to be part of the sustainability solution by processing its organic wastes – producing clean fuel for local fleets and compost for depleting soils while at the same time helping stabilize the global climate, and creating the makings of a sustainable future.

Every project that Energy Vision's work has inspired has energized our team, representing one more step toward the carbon-free future our world needs. But now, we must pick up the pace in helping turn off our country's methane tap. If your local officials have not yet considered anaerobic digestion options, it is time to encourage them to act, and we hope you will share with them our "Community Planning Guide".

The harsh reality is that we face certain destruction of the livable flourishing planet that has been our home if we don't act swiftly. The good news is that, if we do act swiftly in cutting methane, we can all be an important part of the solution.

United Nations Publishes EV's Clean Fuel Recommendations

By Kyle Jeremiah

On July 6th 2021, the United Nations Economic and Social Council (ECOSOC) published recommendations by Energy Vision (EV) to achieve the 2030 Agenda for Sustainable Development. EV highlighted technologies that are commercial today that can turn the world's organic wastes into clean low carbon energy and compost – technologies that can help member nations meet the Paris Climate Goals to limit global warming to 1.5 °C above pre-industrial levels. EV received special consultative status with ECOSOC last summer enabling our organization to provide expert analysis on the organic waste-to-fuel strategy to leaders around

Nations Unies

Conférence sur les Changements Climatiques 2015

COP21/CMP11

Paris France



COP21 Paris Climate Conference. Credit: COP PARIS/Flickr.

the world through the global UN network.

Trapping methane from organic wastes via anaerobic digestion is a crucial strategy for meeting the world's climate goals. According to a global methane assessment report by the UN, about 60% of global methane emissions result from human activity, and human-caused methane must be cut by 45% this decade to keep warming beneath the threshold agreed to by world leaders. Methane is recognized as having a warming potential 84 times that of carbon dioxide over two decades. When manures and food wastes are the feedstocks for digesters, more greenhouse gases are captured in producing renewable natural gas fuel than are ever emitted by heavy duty buses or trucks burning it. RNG fuel is the only fuel today achieving a superb "carbon-negative" result!

The organic material left over in anaerobic digestors after gas removal, is also valuable. It can be used as a nutrient-rich soil amendment that can displace chemical fertilizers.

Energy Vision's recommendations were published ahead of the 2021 ECOSOC High-level Segment held from 13 to 16 July 2021.

PROJECT SPOTLIGHT

RNG around the World

As a core component of its work, Energy Vision focuses on the intersection of waste management and sustainable transportation—the potential for fueling heavy duty vehicles with ultra-low-emissions renewable natural gas (biomethane) made from organic wastes.

The adoption of RNG is rapidly gaining ground as a de-

carbonization strategy in North America, including with high-profile fleets like UPS, Amazon, Waste Management, LA Metro and NYC Transit.

But use of biomethane is on the rise elsewhere—primarily in Europe. Governments there support it as a key strategy for decarbonizing fuel and energy systems.

For example:

- In northern France, half of the city of **Lille's** fleet of over nearly 500 buses runs on biomethane—produced locally from residents' household waste.
- In Italy, the European leader in CNG vehicle use, grocery store chain **Lidl** is adopting bio-methane fueled tractor trailers.
- In northern Italy, **Air Liquide** and an Italian partner have begun work on two agricultural biomethane projects, which will connect to a new fueling facility for heavy trucks.
- British supermarket chain **Waitrose** is replacing diesel trucks with CNG models using biomethane. Parent company, The John Lewis Partnership, plans to convert all 600 of its "heavy goods vehicles" to biomethane by 2028, and is building a biomethane fueling station nears its distribution headquarters.
- Another chain of UK supermarkets, **ASDA** (owned by Walmart), plans to transition its core fleet of 1,000 tractor units to biomethane by 2024.
- Baked-goods manufacturer Warburtons, based in the north of England, is transitioning its 125-tractor "primary fleet" to biomethane over five years, starting in 2021.
- Since January 2020, the English city of **Bristol** has rolled out 77 buses fueled by biomethane produced from food waste.
- Just west of Bristol, what is billed as the world's larg-

est public-access biomethane fueling station is under construction, near the intersection of two of the UK's busiest freight routes. Expected to open in late 2021, the facility will be able to fuel 80 heavy-duty vehicles per hour, initially dispensing biomethane made from food waste, and then switching to fully carbon-neutral biomethane made from manure in 2022.

- In **Berlin**, biomethane made from the city's household waste fuels 150 of the city's refuse collection trucks.

With businesses and local, regional and national governments looking for ways to meet their waste management and emissions-reduction targets, particularly in the transportation sector, RNG/biomethane stands out as the only readily available fuel that can be net-carbon-neutral, or even net-negative. So this fuel promises to be an important addition to the portfolio of solutions needed to secure a global sustainable future.



What is believed to be the world's largest biomethane refueling station operated by CNG Fuels will support low-carbon heavy goods vehicle deliveries in Wales and South West.

Photo credit: CNG Fuels

PROJECT SPOTLIGHT

Colorado: A Showcase for Communities Turning Wastewater Plant Biogases into Clean Vehicle Fuel

In May of 2016, Energy Vision and the Denver Metro Clean Cities Coalition co-sponsored the first statewide workshop on the potential for converting Colorado's organic wastes to clean fuel, especially for the state's truck and bus fleets.

"The State," said EV's Founder Joanna Underwood "is rich in RNG feedstocks. Its 11 large wastewater treatment plants are one valuable resource." At the time of our workshop there was one wastewater RNG project, at the Persigo wastewater treatment plant in Grand Junction – the first organic waste-to-fuel project in the state. There are now four RNG projects at Colorado wastewater facilities.

Since 2016, the renewable natural gas produced at Grand Junction's Persigo wastewater plant has been powering roughly 80 municipal vehicles and transit buses. Prominently featured at Energy Vision's Denver workshop, the project has been both noticed and replicated—three more Colorado wastewater plants have joined it in turning biogas into vehicle fuel, displacing a total of one million gallons of high carbon diesel and cutting an estimated 22 million pounds of CO2 emissions a year.

- The wastewater treatment plant in Englewood finished installing its RNG system in 2019, and now exports the equivalent of 640,000 gallons of fuel annually to out-of-state vehicle markets.
- In Boulder, a cogeneration system running on wastewater biogas was replaced in 2020 by an RNG project that now fuels up to 38 local garbage trucks.
- In Longmont, the wastewater treatment plant is now converting the biogas it produces into fuel for local vehicles, including 16 municipal garbage trucks.

Colorado's projects demonstrate how individual communities can join the global fight against climate change by thinking locally and using their core infrastructure to convert their "waste" into clean, low-carbon vehicle fuel.

For other communities interested in producing RNG fuel from their wastewater plants, contact Energy Vision at admin@energy-vision.org.