



NEW YORK STATE'S VAST POTENTIAL FOR ANAEROBIC DIGESTION AND RENEWABLE NATURAL GAS

Expanding anaerobic digestion (AD) of organic wastes to produce renewable natural gas (RNG) fuel can benefit New York State in many ways, by helping achieve the State's climate goals, improving public health, and fostering economic development.

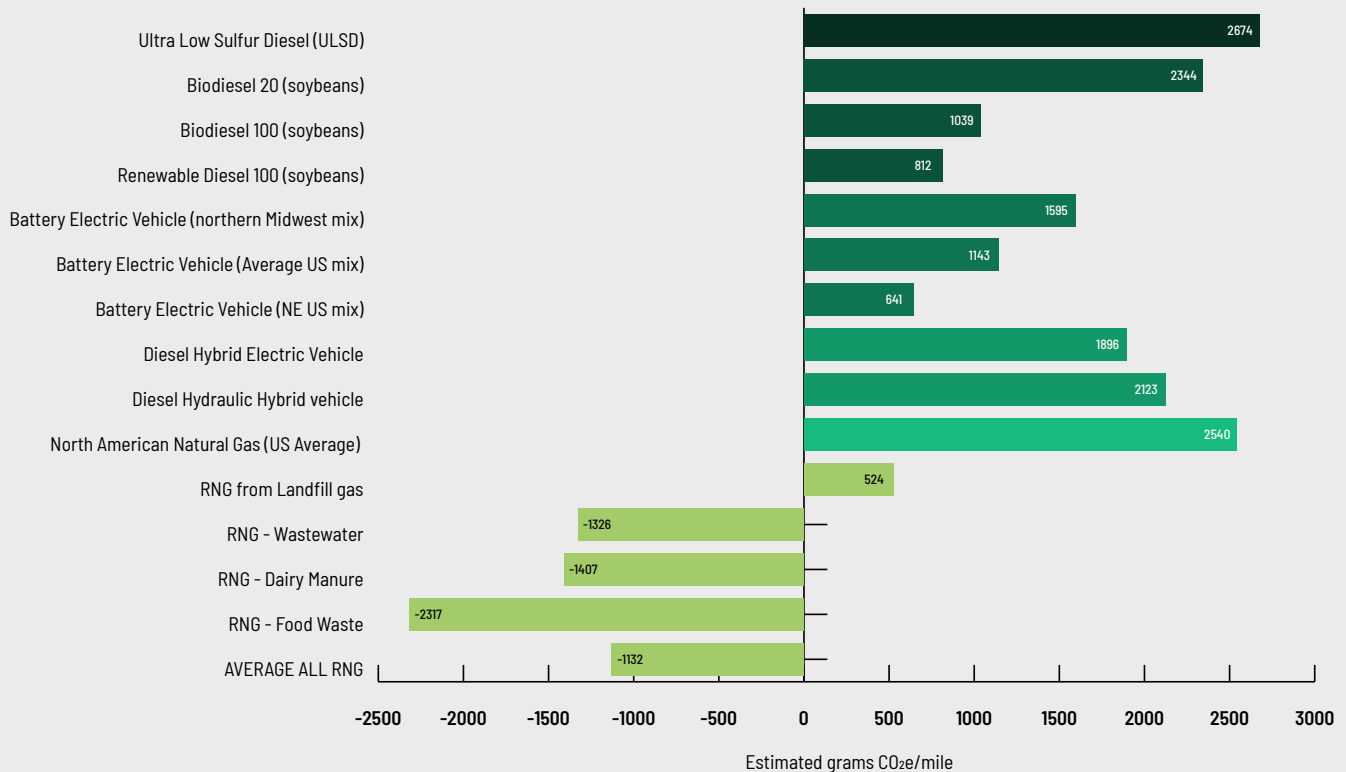
Background: What are AD and RNG?

As organic wastes decompose, they release methane-rich biogas. Methane is a "climate super pollutant," with an environmental impact that is 84-87 times greater than carbon dioxide over a 20-year period. But rather than escaping into the atmosphere, biogas can be captured when organic wastes are put in airless tanks called anaerobic digesters. The biogas can be combusted for electricity and heat, or – even better – upgraded to renewable natural gas (RNG), while the leftover solids from the digesters can be used as a replacement for petroleum-derived fertilizers.

RNG, a gas sustainably produced from organic wastes, is chemically similar to fossil gas and can be used in all the same applications – cooking, heating, power generation, transportation, and more. Unlike fossil gas, **RNG requires no drilling**. Depending on its feedstocks, **RNG is close to carbon neutral or net-carbon-negative**. According to the California Air Resources Board, on a lifecycle basis RNG use in transportation represents an **80+% reduction in GHG emissions** compared to diesel when derived from landfill biogas (see chart below). When derived from wastewater, animal manure, or food waste, RNG is deeply carbon negative, as it captures more greenhouse gases (methane) during production than it releases (as CO₂) when burned. This makes RNG among the lowest-carbon commercially viable energy and fuel sources available today.

Comparative Lifecycle GHG Emissions of Various Transport Fuels

Source: Derived from Argonne GREET (2022)



How AD and RNG Can Help New York State

- New York has developed ambitious GHG reduction policies under its Climate Leadership and Community Protection Act (CLCPA), yet efforts to address one of the major sources of methane – the waste sector – have failed to garner the attention they deserve. Methane comprises a full 39% of New York’s GHG emissions, and with such a frontloaded impact, it is critical to reduce methane significantly this decade to avoid runaway climate change.
- **Organic wastes account for 34% of the State’s methane emissions, or 13% of its total GHG emissions.** Organic wastes generate nearly triple the methane emitted by the oil and gas industry (including pipelines) in NYS. New York can’t do very much about the 77% of its energy-related methane emissions that are upstream and out-of-state in the near-term, but it can absolutely do something very practical about its in-state organic waste. Using anaerobic digesters is one recognized strategy for capturing the methane-rich biogas from organic waste, along with composting. NYS is home to around 200 sites with operational anaerobic digesters or biogas collection systems, but it has an achievable potential of another ~300, as we detail below.
- Energy Vision estimates that diverting organic wastes from landfills to ~20 new-build anaerobic digesters could reduce New York State’s net methane emissions from solid waste management and exported waste by 90%. This would lower total NYS methane emissions by 11.2% (based on 2018 and 2019 figures, the latest comprehensive data available and the basis for the State’s Annual GHG Inventory and Solid Waste Management Plan). As more food waste is redistributed rather than discarded throughout NYS, less will be available as AD feedstock, but the net effect would still be 11.2%, based on the assumptions we detail in our report [Putting New York’s Organic Waste to Work](#).
- In the agricultural sector, Energy Vision calculates that building ~260 new anaerobic digesters could cut methane from dairy manure by 56.5%, trimming another 3% from total NYS methane emissions. Building ~20 anaerobic digesters at additional major wastewater plants could reduce total NYS methane by another approximately 0.8%, based on our research.
- **The bottom line: building all achievable new anaerobic digesters – roughly 300 – could reduce New York State’s methane emissions by 15%.**
- **Meeting New York State’s achievable AD potential could equate to roughly 8,000 new jobs across ~300 new projects and approximately \$3.4 billion in capital deployed,** a significant portion of which is expected to come from private capital markets and federal funding through the Inflation Reduction Act.
- Once captured, biogas can be upgraded on-site to [RNG: the lowest carbon fuel available and a proven commercial option today using existing technology](#). Using RNG to displace diesel – the dirtiest, highest-carbon fuel still powering the vast majority of heavy-duty vehicles in NY – means big decreases in two health-threatening air pollutants: a 90% drop in nitrogen oxides (NOx) and a 60% drop in particulate matter (PM). This would provide enormous public health benefits, especially in environmental justice communities where diesel traffic is concentrated.
- New York’s achievable RNG potential using landfill, wastewater, dairy manure, and food waste sources is approximately 44.4 million MMBTU per year. For reference, this much RNG could power 431,000 New York homes that cannot be readily electrified (such as a significant portion of New York City’s pre-war residential properties that analysis under Local Law 97 has shown are not economically viable for electrification, now or for the foreseeable future).
- **If used for transportation, this amount of RNG would be equivalent to approximately 320 million gallons of diesel per year.** It could thereby power some 32,000 refuse trucks indefinitely – enough for more than 15x the number of garbage trucks in NYC or about one sixth of the nationwide refuse truck fleet.
- The Final Scoping Plan under the CLCPA now makes it clear that New York State will continue to rely on natural gas to a large extent for the foreseeable future. As residential, commercial, and industrial technologies and strategies to transition away from natural gas scale up, it is also critically important to minimize or mitigate methane emissions from existing natural gas infrastructure. Real-time methane monitoring of pipelines and stopping pipeline leaks are vital goals, as is scaling up of RNG to displace significant existing volumes of fossil gas flowing through those pipelines.

Two Policy Changes Needed in NYS

Two policy changes would accelerate the expansion of AD infrastructure and RNG use in NYS and all the associated benefits: adopting lifecycle carbon accounting and passing a Clean Fuel Standard (CFS).

- Lifecycle carbon accounting measures all greenhouse gases associated with a fuel or energy source, from production and transportation to end-use, rather than measuring just emissions from vehicle tailpipes and smokestacks in the State. It is the gold standard used by the federal government and other states with ambitious climate laws.
- A Clean Fuel Standard (CFS) created at the state level is a program in which producers selling low carbon fuels in that state earn valuable credits, while producers selling high carbon fuels must buy credits from the clean fuel producers. Virtually no government funds are spent on implementing these standards; instead, the high carbon fuel producers are actually paying for the expanded use of clean fuels. California, Oregon, and Washington now have CFS programs and several others are considering this proven approach. California in particular has seen major progress on its climate goals thanks to its CFS, surpassing its 2024 transportation decarbonization target two years in advance.

Please see our report [*Putting New York's Organic Waste to Work*](#) for further info and citations.

For more on RNG, where it is produced and used today, and EV's publications, please contact:

Michael Lerner, Director of Research & Publications

Energy Vision

138 E 13th Street, New York, NY 10003

lerner@energy-vision.org