

Turn your waste into a resource



Waste from alcohol production –

An untapped resource



Mash can be turned into energy, compost, and fertilizer.

Collectively, the wine, beer and distilling sector produces millions of gallons of stillage, grape pumice, wort etc. every year, as a waste byproduct of the process that turns crops into alcohol. Kanadevia Inova, a leading global clean technology company that specializes in converting waste byproducts to energy and other valuable resources, is focused on partnering with distillers, brewers, and wineries, and enabling the conversion of this byproduct into a renewable energy and a fossil free agricultural fertilizer, which has significant advantages. Kanadevia Inova can process these byproducts to generate and capture methane for use as fuel to operate the plant, inject in the natural gas grid, or utilize for transportation; capture and liquify CO₂ for utilization by the plant, cold storage, or even sequestration; and provide residual water that can be cleaned and brought back to the plant for cooling and processing – giving clients avenues to choose the right combination of higher revenues and lower operating costs.

All in all, utilizing these waste byproducts reduces greenhouse gas emissions and water demands, while continuing to provide a fertilizer product for agricultural use. Kanadevia Inova's technologies offer a far better alternative to the historical practice of giving this waste away for free or, even worse, paying to have it removed.



Kanadevia Inova provides integrated on-site waste conversion facilities and emissions reductions.

Turning alcohol waste into energy – how does it work?

Kanadevia Inova has proprietary in-house waste to energy solutions, from preparation and pretreatment, anaerobic digestion, gas cleaning and compression, to CO₂ capture and utilization, as well as green hydrogen generation technology. In addition to generating carbon negative renewable energy, Kanadevia Inova's waste to energy solutions can provide a fossil-fuel free byproduct that can be utilized in fertilizer production. The carbon negative renewable energy generated can provide a large-scale plant, the majority, if not all, of its natural gas or electricity needs via a carbon negative natural gas or electricity, thereby drastically reducing both its operating costs and its total GHG footprint. Kanadevia Inova has the expertise and resources to provide these solutions on a turnkey and financed basis, allowing the customer to focus on its core business of producing and delivering beer, wine and spirits to its markets and customers.



Kanadevia Inova provides integrated waste-to-resource solutions for alcohol manufacturers.

From a waste problem to a waste solution

Currently, waste from wine, beer and spirits manufacturing is not widely being utilized as an energy resource and has not equated historically to generating revenue, but has been more of an inconvenience that needs to be coordinated and managed. In addition, there is currently an environmental impact of the waste byproduct from alcohol manufacturing – organic waste emits methane and CO₂, which are harmful greenhouse gasses (GHG), and a substantial amount of water is used in production. The GHG emissions and water impacts increase environmental scrutiny, regulatory oversight, and potential long-term liability, which add increased cost and ultimately do not add value to the customer experience.

Today, thanks to innovations in clean technology, organic waste from manufacturing can be used as a resource that brings financial benefits instead of costs and better environmental stewardship.



Biogas San Luis Obispo: A finance, design, build, own, operate (FDBOO) resource recovery facility by Kanadevia Inova

We provide integrated resource recovery solutions for waste

Renewable energy, compost and fertilizer from waste – Biogas San Luis Obispo, California

Kanadevia Inova's Biogas SLO high solids anaerobic digestion (Dry AD) plant is entering its sixth year of operation, marking a successful initiative in organics diversion. This collaborative effort involves the community, including residents, businesses, local and state government, and wineries in the area. Together, the community are facilitating the diversion of organic waste from landfills, converting it into renewable energy, nutrient-rich liquid soil fertilizer, and an organic compost that collectively benefit the local community with green carbon negative electricity and an agriculture resource.

Heath Jones, president and managing director of Kanadevia Inova North America, outlines the company's approach to sustainable waste management. "At Kanadevia Inova, we see waste as a valuable resource and recognize the increasing state and federal incentives for organics diversion from landfills. Traditional composting, while common, has significant drawbacks like not capturing any potential energy,

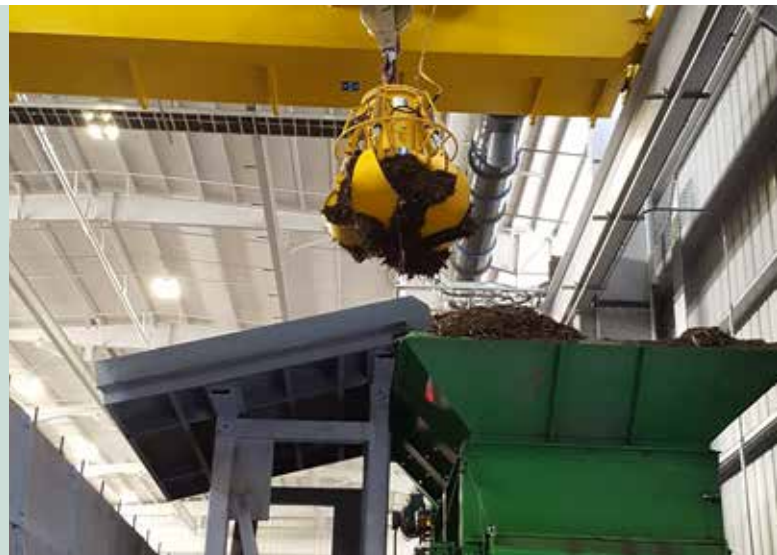
emitting odors, and lack of methane and greenhouse capture. In contrast, anaerobic digestion, when done properly, captures the potential energy of the organics, captures harmful methane and other greenhouse gases, controls odors, and produces a nutrient rich soil amendment to benefit agriculture."

The Biogas SLO plant is recognized as one of the most advanced plants in the US. The facility employs Kanadevia Inova's integrated resource recovery solutions, utilizing the cutting-edge technology of anaerobic digestion to transform organic waste into renewable energy and fertilizing products.

Effective measures are in place to contain odor and emissions that promote seamless integration into the surrounding neighborhood and broader community. The process of converting waste into energy and other by-products actively involves and garners support from the community, demonstrating a sustainable waste management approach.

Since 2018 Biogas SLO has:

- Diverted 144,273 tons of waste
- Produced 10,200,350 m³ of biogas
- Supplied 11,126,483 kWh to grid
- Produced 33,412 tons of compost
- Produced 6,512,934 gallons liquid fertilizer
- Donated 800 tons of compost



Inside Kanadevia Inova's Biogas facility in San Luis Obispo



Kanadevia Inova breaks ground at Kentucky Distillery

Kanadevia Inova North America is a proud partner with 3 Rivers Energy Partners on Kentucky’s largest distillery RNG project. Kanadevia Inova is providing the overall technology, engineering, procurement, and construction of wet Anaerobic Digestion (AD), Amine Biogas Upgrader system, and integrated process piping and controls for the facility, to convert spent stillage into renewable biomethane that will supply energy to the distillery. Our digesters will also produce a carbon-negative, fossil-fuel free byproduct that will be converted into fertilizer.

On completion, the plant expansion project will:

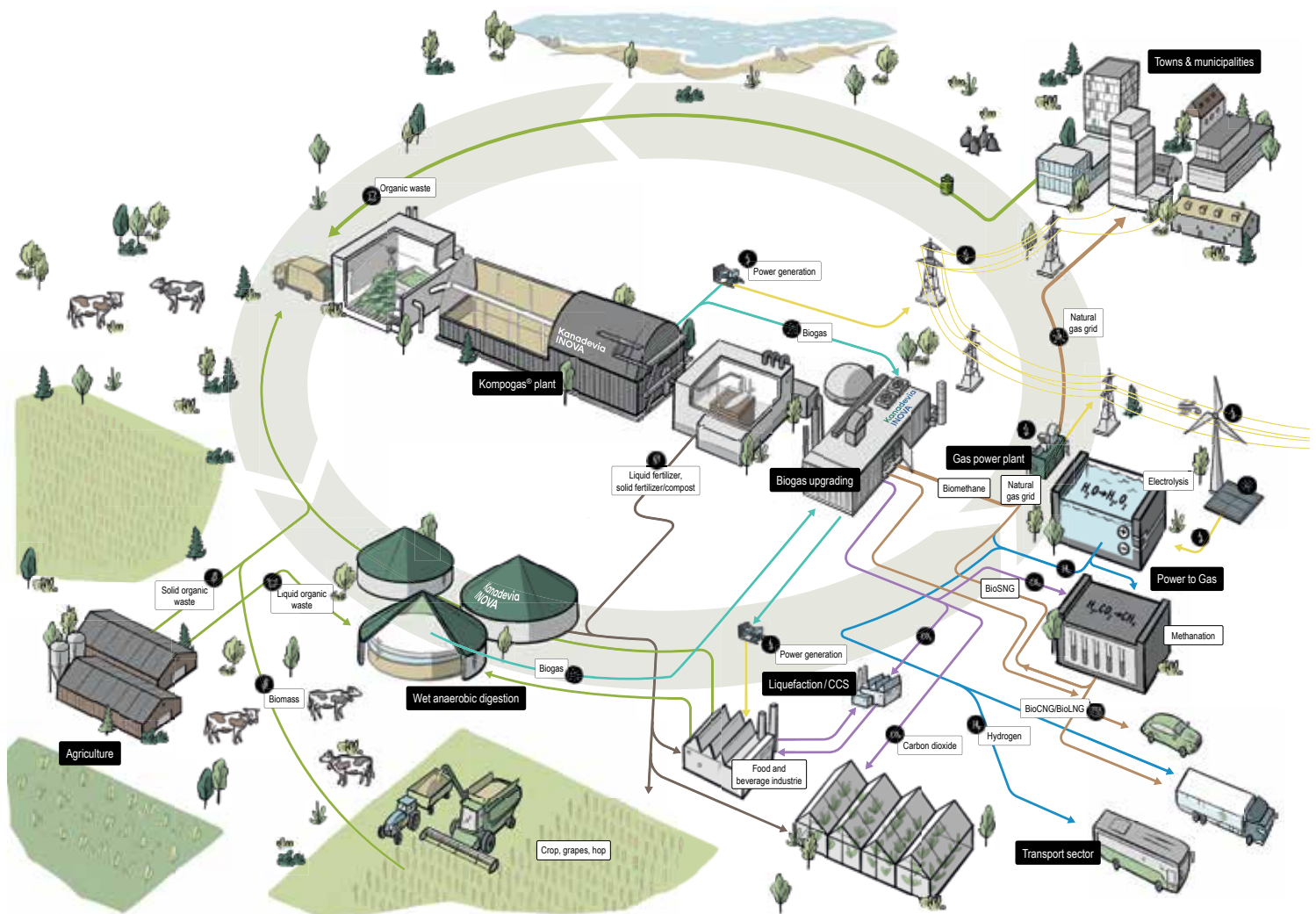
Increase
plant
capacity **50%**

Reduce
greenhouse
gas emissions **50%**

Powered
by RNG **65%**

The distillery will also reduce fossil-based natural gas usage to 35%, produce revenue-generating fossil-free fertilizer and compost, harness over 110,000 tons of high-purity CO₂ p/yr for reuse, and throughput of up to 1 million tons of stillage.

RNG – integrated resource recovery



Why our partners choose to work with us:

- Global leader in integrated RNG technology solutions
- Comprehensive industry-leading digestion and gas cleaning technology
- In-house engineering, procurement, and construction management capabilities
- In-house service, operations, and plant monitoring expertise
- Dedicated R & D – waste processing, RNG, hydrogen, carbon capture and utilization

About Kanadevia Inova

With offices in Knoxville, Norcross, San Luis Obispo, and Montreal, Kanadevia Inova North America is part of the Swiss-Japanese Kanadevia Group. Kanadevia Inova NAM is one of North America's leading suppliers of biogas processing plants and Waste to X technologies. Headquartered in Zurich, the green-tech group Kanadevia Inova is a global leader in solutions for energy transition and circular economy, including Waste to X and RNG. Kanadevia Inova acts as a project developer, technology supplier, and engineering, procurement, and construction (EPC) contractor delivering complete turnkey plants and system solutions for thermal and biological waste recovery. The group's innovative and reliable solutions have been part of more than 1,600 reference projects worldwide.

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