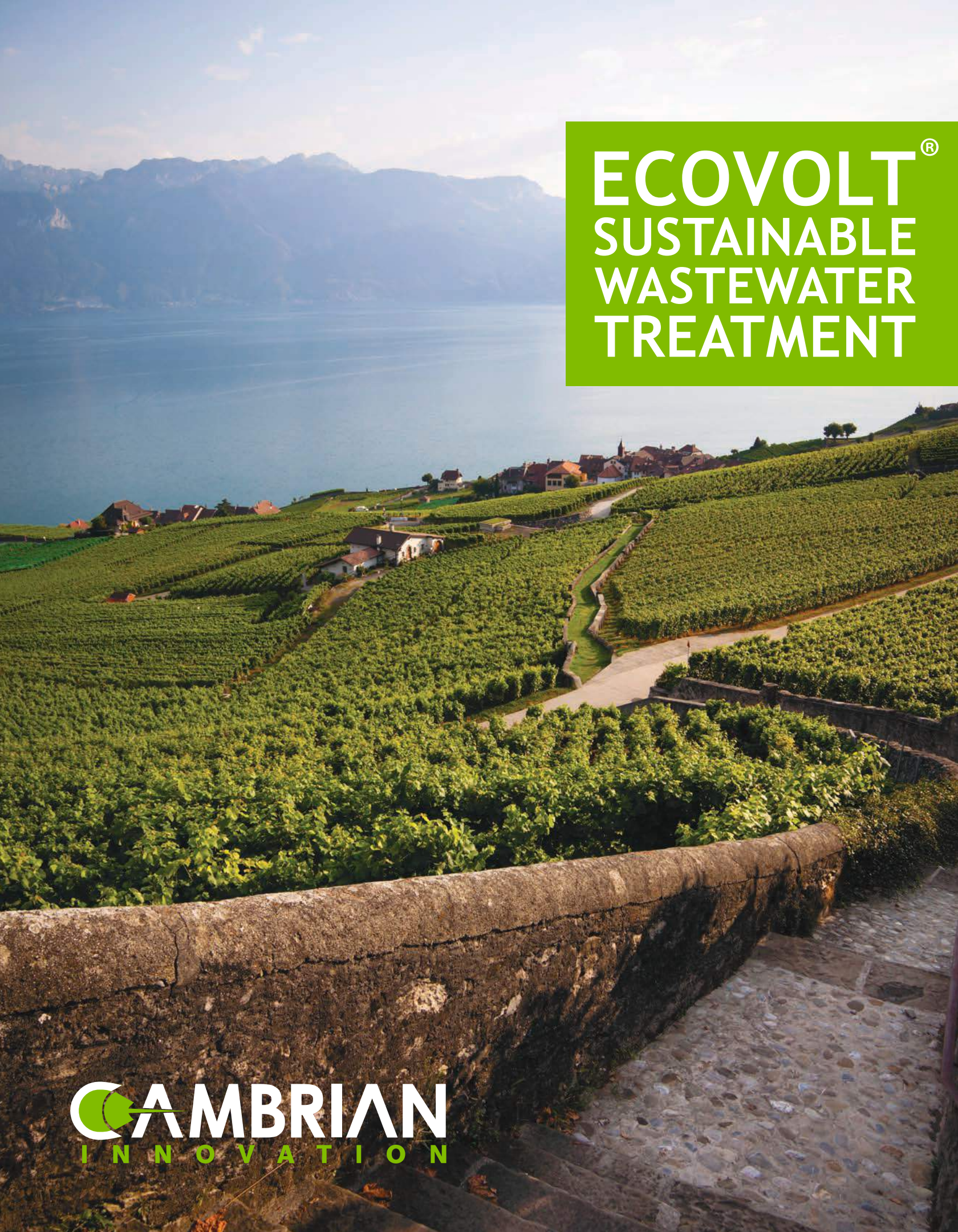


# ECOVOLT®
## SUSTAINABLE WASTEWATER TREATMENT

CAMBRIAN
INNOVATION

# Cambrian EcoVolt

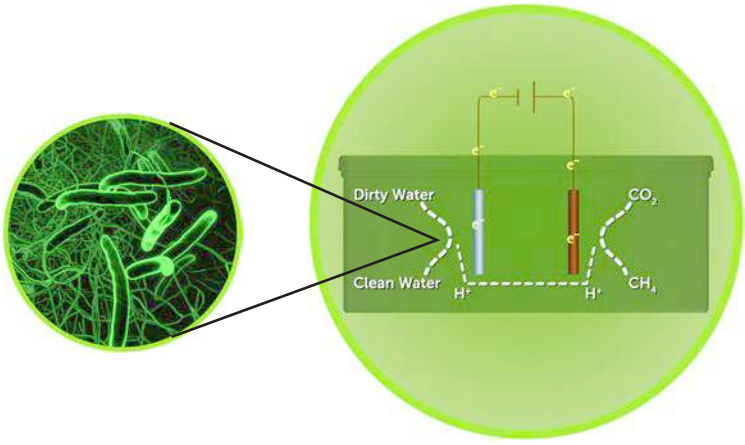
## What is EcoVolt

EcoVolt is the world's first bioelectrically enhanced wastewater to energy system. Leveraging newly discovered electrogenic bacteria, EcoVolt converts pollutants in wastewater into high quality methane gas, helping industrial beverage and food producers monetize their wastewater stream while meeting their environmental compliance and sustainability goals. As a turn-key system, it can be installed quickly and operated remotely, saving food and beverage companies hundreds of thousands of dollars annually while cutting their carbon and water footprint.

## EcoVolt Technology

In 1999 scientists discovered that certain microbes are capable of generating and consuming electricity while treating and sensing pollutants in wastewater. The discovery ignited a race to commercialize wastewater treatment and environmental sensing technologies based on the phenomenon.

Cambrian EcoVolt uses a particular kind of bioelectricity, called *electromethanogenesis*, in which biologically coated electrodes in the reactor rapidly convert organic pollutants into electricity and secondary electrodes subsequently convert electricity into methane fuel. The methane produced by EcoVolt is high quality and can be used in a combined heat and power system to generate clean heat and power at a facility. The net result is clean water and renewable methane, from wastewater.




## Who it is for

EcoVolt is ideal for wineries, breweries and other food and beverage producers seeking flexible, small footprint wastewater treatment for:

- Greenfield sites
- Production expansion
- Cost savings and increased sustainability on existing sites
- Process water re-use strategies

*Typical food and beverage facilities generate 3 - 7 times the amount of wastewater as products, leading to large water footprints and wastewater management costs. With rising water scarcity, many facilities are moving towards process water treatment and re-use.*

## Heat, electricity and clean water from wastewater

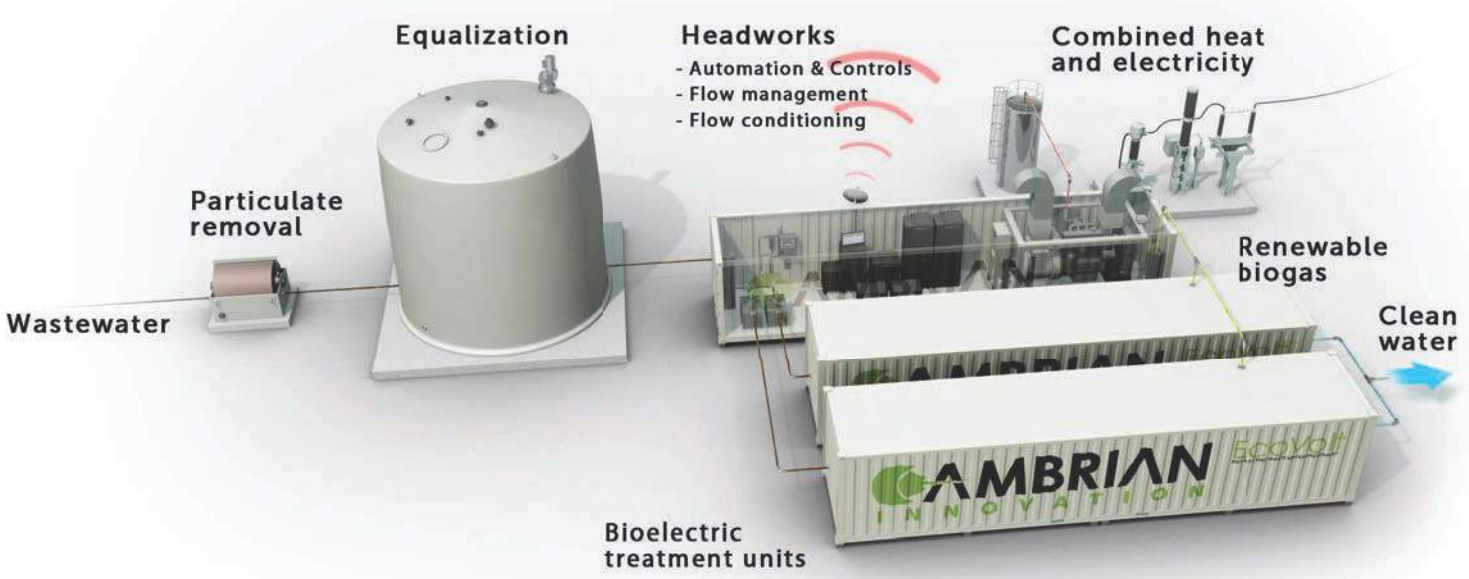
A typical EcoVolt installation includes prefabricated process units for wastewater treatment and energy generation. Wastewater is first screened to remove larger particles and solids, and then sent into an equalization tank to even out fluctuations in concentration and volume. Within the EcoVolt reactors, electromethanogenesis enhances natural anaerobic treatment, improving stability, control, and gas quality. High quality gas exiting the EcoVolt treatment units is sent to a boiler or cogeneration system that converts it to clean heat and electricity for use on site.

Treated wastewater exits the reactor with 80% -90% of the pollutants removed, enabling its re-use on-site with minimal subsequent effort. Using the direct electrical read-out from the bioelectrochemical process, the system is completely automated and remotely monitored for minimal operator intensiveness. Combining treatment, heat, and electricity generation can save facilities hundreds of thousands of dollars a year in operation cost, turning a facilities wastewater problems into a low-hassle opportunity for savings and sustainability.

## EcoVolt System Specifications

| | EcoVolt Mini | EcoVolt | EcoVolt XL |
|---|---|---|---|
| Form Factor | Single Container | Headworks + Expandable Modules | Custom |
| Flow Rates (Gallon Per Day) | 5,000 - 15,000 | 10,000 - 300,000 | 200,000 + |
| Treatment Capacity (KG BOD/Day) | 100 - 600 | 100 - 9,500 | 2,000 + |
| Gross Renewable Biogas (SCFM) | 1 - 6 | 1 - 100 | 20 + |
| Gross Renewable Heat* (BTU/Hour) | Up to 260,000 | 40,000 - 4,180,000 | 860,000 + |
| Gross Renewable Elecricity* (KW) | NA | 30 - 400 | 100 + |
| Variable Treatment Rate | Y | Y | Y |
| Automated Control | Y | Y | Y |
| Energy Efficiency Credits | Y | Y | Y |
| Remote Monitoring | Optional | Standard | Standard |
| Sustainability Dashboard | Optional | Standard | Standard |

* Net renewable heat and electricity dependent on site characteristics and wastewater type





## EcoVolt Mini

The Cambrian EcoVolt Mini provides wastewater treatment for small to mid-scale food and beverage operations seeking a highly compact, energy efficient, and sustainable system in a single unit. Capable of treating wastewater flows under 15,000 GPD, renewable methane generated by the system is used to heat the reactor and reduce natural gas utilization.


## EcoVolt

The standard EcoVolt is a highly-modular, road-shippable system for renewable heat and electricity generation from wastewater flows of 10,000 – 300,000 GPD. The wastewater then enters the headworks, where it is conditioned, split into sub-streams and sent to EcoVolt treatment units.

## EcoVolt XL

Custom-designed for wastewater flows above 200,000 GPD, the EcoVolt XL is an integrated wastewater treatment solution capable of converting wastewater into clean water, electricity, and heat. Customized to any facility geometry, and capable of achieving any desired effluent quality standard, the EcoVolt XL is an ideal solution for mid to large scale food and beverage producers.

# System Highlights

A typical winery's carbon footprint could be reduced by over 2 lbs of $CO_2$ per case – that is like planting over 1,470 acres of trees annually for a 2 million case winery.

## Robust Wastewater Treatment

EcoVolt's proprietary bioelectric process is highly robust and adaptable to a range of wastewater streams, and therefore particularly suited to varying BOD loads that are typically found in the food and beverage industry.

## Clean Energy Generation

EcoVolt generates high quality methane while treating wastewater. An EcoVolt installation includes prefabricated cogeneration technology to convert this methane into clean heat and clean power. A typical installation will create 30 – 400 kW of power.

## Prefabricated, Turn-key Installation

EcoVolt installations are prefabricated and modular, reducing non-recurring engineering costs and greatly reducing install time and cost. The headworks can be designed to accommodate a high number of modular EcoVolt tanks, creating a low capex option to expand production at any point in the future.

## Automated, Remote Operation

Leveraging, for the first time, a bioelectrochemical treatment process, EcoVolt systems automatically monitor the health of constituent microbial populations, enabling automated and/or remote control of the treatment process and radically decreasing operator intensiveness.

## Sustainable Water Management

Water is an increasingly precious resource and industries globally are moving towards the reuse of process water. The Cambrian EcoVolt system can form the basis for varying degrees of water reuse, whether for irrigation, tank washing or production.


## Technology Comparison

| | Energy Positive | Variable Treatment | Integrated Remote Monitoring | Incrementally Expandable | Small Footprint | Road Shippable |
|---|---|---|---|---|---|---|
| EcoVolt | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ |
| Aeration Pond | ✗ | ✓ | ✗ | ✗ | ✗ | ✗ |
| Compact Aerobic Treatment | ✗ | ✓ | ✓ | ✓ | ✓ | ✗ |
| Upflow anaerobic sludge blanket | ✓ | ✗ | ✗ | ✗ | ✓ | ✗ |

Cambrian Innovation is a leader in rapidly identifying, developing, and deploying environmental solutions using biotechnology. Spun out of MIT in 2006, Cambrian has scaled and validated systems that recover resources from wastewater, eliminate energy required for wastewater treatment, radically reduce the cost of nitrate-nitrogen treatment, and help agricultural operations monitor their inputs more easily and efficiently. Cambrian's flagship product, EcoVolt™, is the world's first and only industrial-scale, bioelectrically enhanced wastewater treatment system, empowering food and beverage companies to cut water and energy costs while monetizing their wastewater.

Named a Top 50 Water Company globally by The Artemis Project in 2012, Cambrian has developed solutions for a range of industrial leaders and government agencies such as NASA, the Department of Defense, the Environmental Protection Agency, the Department of Agriculture, and the National Science Foundation. Cambrian was recognized as a sustainability technology leader at the SXSW Eco Conference, a Going Green Silicon Valley Global Top 200 selection, and won the grand prize in the nationwide Cleantech Open.

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