

Wet Anaerobic Digestion Allows EFW Plant to Generate Almost 25,000 Megawatts Annually

Harvest Power's Energy Garden in London, Ontario turns organic materials into clean, renewable energy and fertilizers. Through advanced digestion technology, naturally-occurring micro-organisms produce renewable biogas energy from food scraps, grease, and other organic waste materials. The remaining digestate is turned into organic fertilizer granules.

The Energy from Waste facility uses a wet anaerobic digestion technology to turn 65,000 tons of mixed organic materials into 2.85 megawatts per hour of electricity and 5,200 tons of fertilizers. This cost-effective processing option helps the community lower costs, meet recycling targets, provide renewable energy and return nutrients to local farms and fields.



Greatario Engineered Storage Systems and CST Storage designed and constructed the anaerobic digester along with other process tanks. Having the technology to provide various types of storage tanks with specific roof applications to handle the different stages of the digestion process was important to Harvest Power. Greatario and CST manufactured and built nine tanks utilized at Harvest's Energy Garden in London. In the design stage, Harvest anticipated 20-25 waste delivery trucks per week, or 120,000 tons of waste, would be processed each year. Construction of multiple tanks began in 2011.

Reception and storage tanks

Organic materials entering the system are ground up and de-contaminated. They are then separated into regular organics (food waste) and higher strength organics (fats, oils and greases) which are stored in separate tanks:

- 7.68 m x 5.87 m (68,000 USG) Aquastore glass-fused-to-steel tank with a glass knuckle roof. Knuckle roofs tend to be used for smaller diameter tanks.
- 4.26 m x 7.27 m (26,300 USG) Aquastore glass-fused-to-steel tank with a glass knuckle roof.
- 13.64 m x 11.45 m (431,000 USG) Aquastore glass-fused-to-steel tank with a Temcor aluminum dome.

Digesters

A custom recipe of organics is transferred to the hydrolysis tank for pre-digestion. The organic slurry is then fed to two complete mix, mesophilic anaerobic digesters:

- 11.09 m x 11.46 m (269,000 USG) combination epoxy and glass zone tank, with an externally supported roof (ESR). The ESR is often used when medium to high pressure or vacuum designs limits are expected. They are also preferred for heavy load conditions.
- 20.46 m x 18.44 m (1,523,000 USG) hybrid epoxy/glass zone tank, insulated and clad with an externally supported roof.



Digestate storage tank

The digestate remaining from the anaerobic digestion process is dewatered to produce a fertilizer product. Greatario's bolted tanks easily adapt for hybrid tank designs, allowing for different coating systems for the gas and liquid zones of the digester:

- 18.76 m x 8.7 m (610,000 USG) hybrid epoxy/glass zone tank with a gas holder membrane roof.

Pre-aeration tank

The pre-aeration tank is used to pretreat the liquid effluent that comes from the solid/liquid separation of the digestate:

- 24.73m x 7.27m (844,600 USG) epoxy tank designed for a dome roof.
- 5.11m x 7.27m (38,000 USG) Aquastore glass-fused-to-steel tank with a glass knuckle roof.

Article courtesy of Greatario Engineered Storage Systems

Benefits of CST's Bolted Tank Technology:

- All tank parts are factory coated for maximum protection and are easily transported to the job site.
 - Bolted tanks can be erected in 1/3 of the time required to build a field-welded or concrete tank on-site.
 - Tanks can be assembled in even the most remote sites, without large staging areas, and in every season of the year.
 - Bolted tank construction is very conservation-friendly with little disturbance to the surrounding environment.
 - CST bolted tanks are factory coated, so there is no in-field painting required which can expose the environment to harmful silica from sand blasting or paint overspray.
 - Tanks are assembled at ground level using a unique jacking system that progressively elevates the structure to install the panels without the need for expensive cranes or staged scaffolding.
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CST Contact Information:

CST Industries, Inc.

Kim Mathis
Global Marketing Director
713.351.3769
kmathis@cstindustries.com

CST Industries, Inc.

Pat Howell
Global Business Development Director – BioEnergy
913.815.1274
phowell@cstindustries.com

CST Represented in Canada by:

Greatario Engineered Storage Systems

Pat Logan
Marketing
519.469.8169
plogan@greatario.com

Greatario Engineered Storage Systems

Scott Burn
Sales
519.469.8169
sburn@greatario.com