Zero Waste™ ENERGY, LLC.
Recovery and Energy with Zero Waste

BLUE LINE TRANSFER, INC.

SOUTH SAN FRANCISCO SCAVENGER COMPANY, INC.

BLUE LINE BIOGENIC CNG FACILITY

In a partnership with Blue Line Transfer, Inc. and South San Francisco Scavenger Co., Inc., Zero Waste Energy (ZWE) designed and developed the Blue Line Biogenic CNG Facility—a project essential to addressing numerous California AB 32 requirements. The project includes a SMARTFERM® anaerobic digestion facility that transforms 11,200 tons of food and green waste per year into biogenic compressed natural gas (bio CNG), produces heat to run the operations, and provides digestate that is transformed into high-quality compost. The facility can produce up to 120,000 diesel equivalent gallons (DGE) per year of CNG—enough to fuel approximately 10-12 of Blue Line's CNG-fueled collection vehicles. Each collection vehicle collects enough organic waste during just one route to fuel it for an entire day, creating a true closed loop system and the first project of its kind in the United States. Operations began in January 2015.

- 8 dry anaerobic digesters — 44' (L) x 12' (W)
- Up to 11,200 tons per year of organic waste throughput
- Below-grade, 140,000 gallon capacity concrete percolate tank
- Tail-gas heat recovery system
- Package bio-filter and roof mounted external biogas storage bladder
- Separate enclosed and negatively aerated receiving bay
- 21-day batch process transforms waste into biogas and digestate for high-quality compost

SMARTFERM
DRY ANAEROBIC DIGESTION SYSTEMS

SMARTFERM Technology

SMARTFERM is a state-of-the-art dry anaerobic digestion system that processes organic waste feedstocks and generates renewable natural gas. SMARTFERM systems can include biogas-processing technology for combined heat and power (CHP) generation as well as compressed natural gas (CNG). In addition, in-vessel composting (IVC) options can provide partial or complete maturing of compost for the wholesale or retail market.

Based on the amount of organic waste to be processed, SMARTFERM is offered on two platforms: shop fabricated steel digesters or cast-in-place (CIP) concrete digesters. A basic prefabricated SMARTFERM features steel fabricated digesters, requiring a minimal amount of space. The cast-in-place concrete SMARTFERM digester system combines the SMARTFERM's modular mechanical and electrical systems design with on-site construction of concrete digesters. SMARTFERM facilities can process over 4,000 TPY of any organic material.

The space-efficient, prefabricated, scalable modular system is manufactured in the U.S. by Marathon Equipment Company, one of the solid waste industry's most respected brands of waste handling and recycling equipment. Marathon is part of Environmental Solutions Group, a division of Dover Corporation.

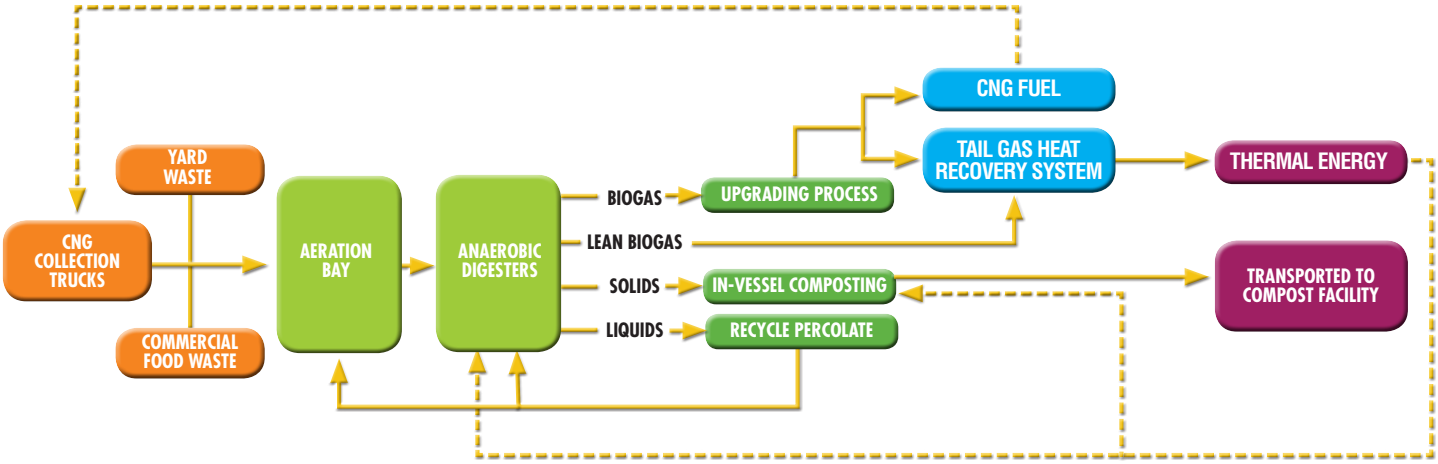
"SMARTFERM will give us the ability to reduce the organics going into the landfill by converting that same waste into CNG fuel that will power our collection routes...a true closed loop system. Good for us, the cities we serve, and California as well."

–Doug Button, President
Blue Line Transfer, Inc./South San Francisco Scavenger Co., Inc.

Benefits of SMARTFERM in South San Francisco

- Assists the City of South San Francisco and commercial clients to achieve California AB 32 sustainability goals with almost 95% diversion of organic waste into landfills
- Produces enough bio CNG to fuel up to twelve of the fleet's CNG-fueled collection vehicles each day
- Reduces CO_2 emissions by using low carbon fuel and avoiding methane generation at the landfill
- Generates heat used to run the facility
- Promotes local companies that can export this technical expertise to other regions throughout the state
- Retains money in the local community by producing jobs locally
- Provides digestate for the production of high-quality compost
- Offers economic solution based on current tipping fees

SMARTFERM AD Process	Results
Maximum Annual Volume	11,200 TPY
Digester Dimensions	44' (L) x 12' (W)
Steel Digesters	8
Residence Time	21 Days
Mode of Operation	Thermophilic (125-131°F)
Biogas Yield (CF/Ton)	3,000 - 3,200
Methane Content (%)	58 - 62
Compressed Natural Gas (DGE/yr)	+120,000 (fuels 18-20 trucks daily)



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