



## Crescent Farm, Haverhill, Mass. Farm Powered® Anaerobic Digester

### FARM BENEFITS

- Odor reduction from replacing raw manure with odorless digestate
- Liquid, organic fertilizer to increase crop yields without overloading nutrient levels
- Reduction in chemical fertilizer use
- Adhere to nutrient management plan
- Displace traditional fuels for heating needs on farm

### CRESCENT FARM FACTS

- 650 acres of produce, pumpkins, gourds, hay and corn
- Operated by third and fourth generations of the Davidowicz family
- Raises dairy cows, goats, sheep, ducks, and rabbits
- Farm activities include farm tours and special events
- Located in Haverhill, Mass.

### SHAW FARM FACTS

- 150-acre dairy farm
- Founded in 1908
- 250 cows milked daily
- Produces more than 1,700 gallons of milk daily
- Located in Dracut, Mass.

### HAVERHILL DIGESTER FACTS

- 660,000-gallon capacity
- 160,000-gallon hydrolyzer
- 3M gallon effluent storage tank
- Constructed 2018

### Annual Digester Input:

- 10 tons per day of manure
- 100 tons per day of organics

### Annual Digester Output:

- Produces 7,700 MWh of renewable energy/year from a 1 MW engine
- Displaces 5,500 lbs. of CO2 emissions daily
- Reduces phosphorus and nitrogen loading on farms
- Provides energy via net metering credits to the City of Haverhill schools and public facilities

Crescent and Shaw Farms are taking huge steps to increase farm sustainability and enhance relationships with their communities. The new Vanguard Renewables Farm Powered Anaerobic Digester project at Crescent Farm in Haverhill, Mass is a cooperative farm venture between Crescent Farm in Haverhill, Mass. where the digester is hosted, and Shaw Farm in Dracut, Mass. The project also had support from the Massachusetts Clean Energy Center (MassCEC).

Approximately 10 tons per day (TPD) of manure will be combined with 100 TPD of pre-consumer organics from food processing and preparation operations in the Haverhill anaerobic digester. Methanogenic bacteria will break down the manure and organics to produce biogas (used to power a 1 MW engine) and digestate material (used as fertilizer).

The engine will produce more than 7,700 MWh per year of renewable energy. The energy will be provided via net metering credits to the City of Haverhill schools and public facilities. The digestate by-product of the anaerobic digestion process will be used to replace chemical fertilizers on the farm.





## 2018 Organics Recycler of the Year National Waste & Recycling Association



### MEETING SUSTAINABILITY GOALS

- Food Waste Recycling
- Renewable Natural Gas
- Renewable Electricity



### WHO WE ARE

**Vanguard Renewables** develops, constructs, owns, and operates farm-based clean energy systems that recycle food waste and farm waste producing Renewable Natural Gas (RNG) or Renewable Electricity. Our long-term organics to energy solutions vertically integrate the organics feedstock chain and farms to solve food waste challenges, generate safe and reliable renewable energy, and sustain farms. By the close of 2018, Vanguard's Farm Powered operating portfolio of anaerobic digesters will represent the largest organics recycling destination in Massachusetts with more than 190,000 tons per year of combined on-farm and off-farm organics being processed.

### WHAT WE DO

Vanguard Renewables' Farm Powered anaerobic digestion facilities are a destination for organic food waste completing a closed loop organics to energy lifecycle. Unlike clean energy system providers of the past, we offer a customized, sustainable, and economically-viable solution for organic waste diversion and renewable energy production. Our strategic partnership with the Dairy Farmers of America (DFA) will help bring anaerobic digestion technology to farms across the country.



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