



The Core Concept

The de-packager enables Exeter Agri-Energy to receive and use all forms of food waste by separating waste from its packaging. Waste is deposited in two anaerobic digesters to be converted into energy.

Anaerobic digestion is a clean, biological process during which animal and food wastes produce biofuel, which is then burned to produce electricity and heat. The process also produces other substantial products, and significantly improves nutrient management practices and local watershed impacts.

Partner Websites

EAE: www.ExeterAgriEnergy.com

ACE: www.AgriCycleEnergy.com

Stonyvale Farm: www.StonyvaleInc.com

De-packager Facts

- The EAE de-packager is the first in the state of Maine.
- The de-packager can process up to 20 tons of both wet and dry organic material per hour.
- One ton of digested food waste offsets more than 15 passenger vehicles per day.
- The de-packager handles paper, cardboard, metal, and plastic.
- Enables businesses and institutions to dispose of bulk, packaged food waste, ultimately converting traditionally landfilled waste into clean energy.

Agri-Cycle Energy (ACE) Facts

- ACE collects and disposes of nearly 25,000 tons of waste per year with the ability to scale this volume exponentially.
- ACE's service footprint spans Maine and New England.

- ACE's fleet comprises collection trucks with either rendering or packer bodies, vacuum tankers, 70-yard dump trailers and tractors.
- Every ton of food waste diverted is approximately equal to 200 gallons of natural liquid fertilizer applied on croplands used to feed the dairy cows at Stonyvale Farm (as opposed to petroleum based chemicals).
- For every four tons of manure and food waste digested, approximately one yard of compost is produced.

Exeter Agri-Energy (EAE) Facts

- The EAE facility has rare capabilities: It's one a handful in the United States equipped for large scale co-digestion.
- The facility is a dual vessel, one megawatt co-digestion system with a total daily treatment volume of approximately 32,000 gallons, or approximately 150 wet tons.
- Of the 32,000 gallons, approximately 75% is cow manure and 25% is food waste; this ratio may fluctuate depending available off-farm materials, digester biology, etc.
- It has a 16-cylinder, 1,500 horsepower engine that burns biogas. {Biogas is approximately 60% methane (CH₄) and 40% carbon dioxide (CO₂).}
- Burning biogas at this facility produces approximately 4MMBtu per hour of heat. That's enough every day to replace 700 gallons of heating oil; on an annual basis, enough to heat 300 New England homes.
- It can also produce 23,500 kilowatt hours of electricity every day; on an annual basis, enough electricity to power as many as 1,000 households.
- The facility has Maine Class I generator certification for renewable energy credit sales.
- It has a lifetime solid waste permit to include all forms of clean organic waste.

Stonyvale Farm Facts

- 5th generation dairy, Maine's second largest
- Produces 8000 gallons of milk per day
- Milk sent to Dairy Farmers of America and sold as a variety of brands throughout New England
- 2000 animals on site; 1000 milked each day, 1000 young stock
- 2500 acres of crop land
- 6 million gallons of manure/effluent storage
- 20 full/part time employees

Market Facts

EAE and ACE are industry leaders, helping client companies respond to environmental and renewable energy trends. Both companies are "ahead of the curve" in recognizing a clear business opportunity, resulting from many favorable market conditions:

- September of 2015, the USDA set a goal of reducing food waste by 50% by the year 2030.
- In 2014, Massachusetts passed the Commercial Food Waste Ban mandating businesses and institutions producing one ton of food waste per week to divert that waste from landfills.
- Maine's voluntary 50% recycling goal applies to residential and commercial producers.
- An undeniable market shift is under way, spurning traditional methods and embracing broader scale techniques, for the disposal of non-farm waste produced by residential households, commercial food processors, distribution centers and large institutions like hospitals and universities.
- The market for green attribute sales channels, including renewable energy certificates and carbon credits, is experiencing a robust expansion and favorable price movement.
- United States dairy farms are under increasing pressure to broaden their search for profitability. Given the cyclical nature of the dairy business (swings in supply vs. demand), it is common for dairy farms to experience annual losses and an erosion of equity when milk prices are low.
- Dairy farms are increasingly looking to reduce farmstead odor emissions, to maintain good neighbor relations.
- Dairy Management Incorporated (DMI) and the USDA have signed a Memorandum of Understanding to collaborate on the goal to reduce by the end of the year 2020, the U.S. dairy industry's greenhouse gas footprint by 25%.

- Anaerobic digestion is now widely recognized as an effective pre-treatment process targeted at achieving better water quality when combined with other technologies, which collectively removes ammonia (N) and/or phosphorus (P) from treated manure. Better water quality is a very attractive policy goal for local, state and federal governments.

Environmental Benefits

Anaerobic digestion combined with de-packaging technology offer Maine and New England businesses a viable and environmentally smart alternative for food waste, which now needlessly fills up landfill space. Also:

- Methane destruction on the equivalent order of removing approximately 3,000 passenger vehicles from the road each year.
- Substantial manure odor reduction in the host community, the Town of Exeter.
- Dramatically improved nutrient management program, protecting the local watershed.

Economic Impact

The project contributes to economic development in Exeter and Penobscot County:

- A multi---million dollar construction project.
- In 2011, the project temporarily created more than 24 full time construction jobs, and two full time, permanent positions.
- Just as important, the project supports the continued viability of Stonyvale Farm, a sustainable Maine family farm that has approximately two dozen employees
- The project has secured a 20-year fixed rate power purchase agreement.
- The project invested nearly \$1 million in a three-phase, utility interconnection upgrade.