

COMPANY  
**SEaB Energy**  
 seabenergy.com

LOCATION  
 Southampton, United Kingdom

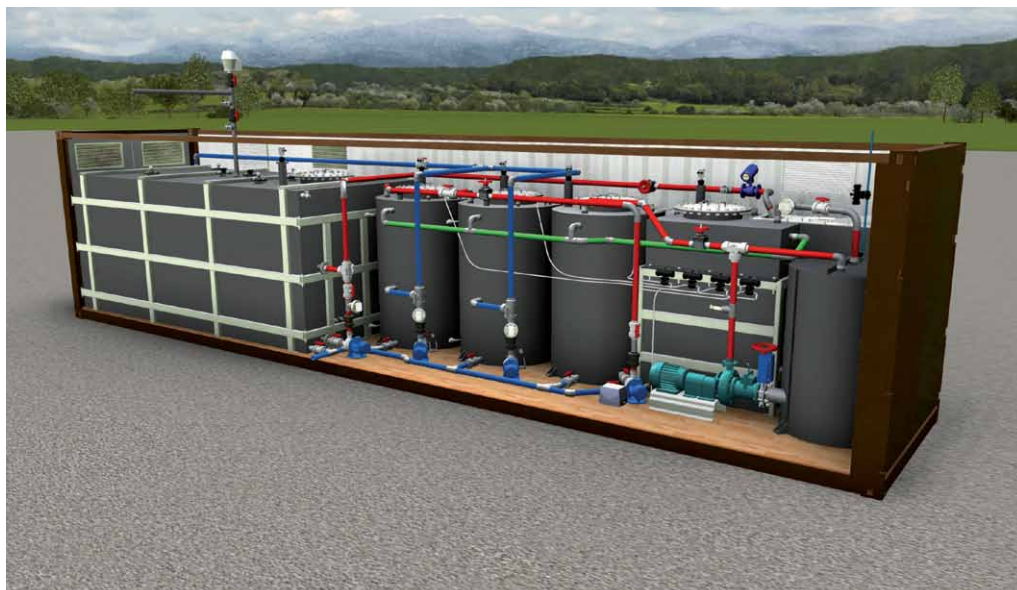
SOFTWARE  
 Autodesk® Product Design Suite Ultimate  
 Autodesk® PLM 360  
 Autodesk® Sim 360®  
 Autodesk® Vault®

# Micro-power solution to a global waste challenge

## Turnkey, self-contained system brings clean power generation to farms and small businesses

There are great advantages to designing in 3D with Autodesk Inventor as opposed to working with a physical prototype. Inventor and our digital prototype helped us pack us much as possible into a very confined space and cut six months off of the development cycle for four engineers.

—**Paul Hackett**  
 Production and Engineering  
 Manager  
 SEaB Energy



SEaB used Autodesk® software to simulate mixing tank operations. © Image courtesy of SEaB Energy.

### Introduction

Sandra and Nick Sassow, co-founders of SEaB Energy, created their company's turnkey, modular anaerobic digestion (AD) units—MUCKBUSTER™ and FLEXIBUSTER®—to help farmers, food producers, and other small businesses transform animal manure, food waste, or septic waste into green electricity, liquid fertilizer, and mulch products, while reducing greenhouse gas (GHG) emissions and fuel consumption.

As visionary as MUCKBUSTER and FLEXIBUSTER may be, their origins are humble. "We lived in a remote area in England with many horse farms all constantly producing manure," says Nick, chief technical officer at SEaB Energy. He noticed that many of the farms had more manure than they could apply to their land, forcing them to move the manure offsite, a process that adds costs, uses large amounts of fuel, and increases emissions. "That made me wonder if I could create a better solution—one that saved money and eliminated the need to transport the manure offsite."

### The challenge

Ultimately, he settled on AD, a process in which microorganisms break down biodegradable material in the absence of oxygen and produce a biogas that can be combusted to generate heat or electricity. Traditional AD systems are large and require enormous amounts of planning, engineering, and supply chain management. They are also prohibitively expensive for most small farms and businesses and require trained engineers to operate.

"We set out to create a self-contained, turnkey unit that delivered the benefits of a larger system without the drawbacks," says Sandra Sassow, the CEO of SEaB. Their ideal system would offer a reasonable payback period, incorporate commonly available parts, and convert between 200 and 1,000 U.S. gallons of stable waste per day into renewable electricity. To protect the complex system—as well as enhance its visual appeal—the Sassows planned to enclose it within a shipping container. "No one had ever done that before, so we were basically starting from scratch."

The Autodesk Clean Tech Partner Program supports clean technology innovators with design and engineering software they can use to accelerate their development of solutions to the world's most pressing environmental challenges. For more information, visit [autodesk.com/cleantech](https://www.autodesk.com/cleantech).

# MUCKBUSTER and FLEXIBUSTER can produce green electricity and fertilizer from animal manure, food waste, and septic waste.



The turnkey, modular anaerobic digesters are safe and easy to operate. © Image courtesy of SEaB Energy.

## The solution

To create the 3D production model from the prototype, Paul Hackett, production and engineering manager at SEaB Energy, used software obtained through SEaB's membership in the Autodesk® Clean Tech Partner Program.

SEaB used Autodesk® Inventor® software, part of the Autodesk® Product Design Suite Ultimate, to envision and refine multiple design scenarios. "There are great advantages to designing in 3D with Autodesk Inventor as opposed to working with a physical prototype," says Hackett. "Inventor and our digital prototype helped us pack us much as possible into a very confined space and cut six months off of the development cycle for four engineers."

For help simulating system performance, SEaB has begun to use the finite element analysis and fluid dynamics simulation tools integrated in Product Design Suite Ultimate. "We used the fluid dynamics tools to simulate the mixing tanks and determine if the pasteurization process would work," says Nick. This allowed him to validate the design on screen and avoid time-consuming and costly design changes in the confined space of the shipping container.

SEaB used Autodesk® Vault® data management software for version control.

## The result

SEaB has three active pilot installations and is ready to implement a full commercial model. "We use 3D design tools for all of our design work," says Sandra. "We could not design and assemble the units without having in-house 3D graphics capabilities."

SEaB's success has not gone unnoticed. In 2012, SEaB was identified by the sustainability initiative LAUNCH: Beyond Waste as one of nine game-changing global waste technologies. "This technology could change the way we manage waste," says Sandra. "You can take these units anywhere in the world, places where a much larger and costlier system is not feasible, and convert local sewage or food waste into as much as 65 kWh of green electricity—enough to power 25 average California homes or 650 average African houses." Such systems could bring safe, clean, renewable electricity to some of the most remote areas of the world, while virtually eliminating the costs, fuel consumption, and GHG emissions associated with waste transport.

This technology could change the way we manage waste globally. You can take it anywhere in the world—places where a much larger and costlier system is not feasible—and generate up to 65 kWh from local sewage or food waste.

—Sandra Sassow  
CEO  
SEaB Energy

As it grows, SEaB will expand its use of Autodesk products, including Autodesk® SIM 360®, which it currently uses to run multiple simulation studies in the cloud simultaneously. "That helps us avoid chewing up our local resources and gets us the answers we need in a short, concise time," says Sandra. SEaB plans on adding Autodesk® PLM 360 for full lifecycle management after it completes its implementation of Vault software.

## For more information

To learn more about the Autodesk Clean Tech Partner Program, visit [autodesk.com/cleantech](http://autodesk.com/cleantech).

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