



Carnival Corporation Pilots Food Waste Bio-Digester Technology to Improve Environmental Compliance

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As part of corporate commitment to sustained excellence in environmental compliance, 15 Carnival Corporation ships are testing food waste bio-digester machines, or "steel stomachs," that separate plastics from food waste while naturally breaking down food particles

MIAMI, Dec. 11, 2019 /PRNewswire/ -- [Carnival Corporation & plc](#) (NYSE/LSE: CCL; NYSE: CUK), the world's largest leisure travel company, today announced it is pilot-testing food waste bio-digester technology to improve environmental compliance and the food waste disposal process on board its ships, and plans to expand the program across its fleet in the near future.

The new innovation in green technology at sea provides a number of benefits, including:

- separating the small pieces of plastics and other debris that can occasionally find its way into food waste for sustained environmental compliance;
- providing more efficient and centralized onsite food waste operations;
- and enhancing onboard public health as well as reducing a ship's carbon footprint by automated and natural processing of food waste.

The bio-digesters reduce a ship's carbon footprint by using an aerobic digestion process that takes place within the machines and efficiently breaks down food particles, releasing a translucent, environmentally safe liquid. This limits the amount of greenhouse gas emitted from conventional food waste processing systems, helping reduce the company's environmental impact.

Currently being evaluated on 15 ships with 12 more ships scheduled in coming months across seven of the corporation's nine cruise line brands – Carnival Cruise Line, Costa Cruises, Cunard, Holland America Line, P&O Cruises (UK), Princess Cruises and Seabourn – food waste bio-digesters are used for successful food waste management at some restaurants, hotels, government facilities, stadiums, theme parks and other locations. The bio-digester systems in Carnival Corporation's pilot test are among the first systems of this kind to be tested on a cruise ship.

Throughout the day, as food scraps are added to the system, a mix of microorganisms, including microbes and enzymes, rapidly and naturally digest the organic waste. The machines operate 24 hours a day, allowing for continuous food "digestion."

"Think of a food waste bio-digester as a large, stainless steel stomach that digests food waste – if you can feed it to people, you can feed it into a digester," said Chris Donald, senior vice president of corporate environmental compliance at Carnival Corporation. "Since we serve meals to millions of guests each year, this new green technology can help us significantly reduce our environmental impact and carbon footprint, while also greatly improving our ability to manage non-food waste, including plastics. We have already seen positive results and significant benefits from these systems, which are technologically advanced yet simple to use. We are excited to continue evaluating different digesters and are currently planning to expand the use of these systems across our fleet as part of our commitment to environmental excellence."

Carnival Corporation is testing three different bio-digester machines, including systems that can evaluate a variety of parameters and produce valuable data, including the weight and volume of food waste digested, the net food waste reduced and the amount of CO₂ reduced, among others. Equally important is that all of these parameters can be automatically uploaded to a cloud server and remotely monitored around the clock by shipboard and shore-side employees.

Food waste bio-digesters are placed in strategic areas such as a ship's galley, allowing for more convenient and efficient food waste processing at the source. Bio-digesters in the pilot feature a screen filter at the bottom of each machine that captures any small plastics and other non-organic debris accidentally mixed with food waste, a feature that improves environmental compliance. The green technology also supports and enhances operations onboard, making it more efficient for crew members to manage and control food waste.

In 2017, the company achieved its 25% carbon reduction goal three years ahead of schedule, and is on track with its nine other 2020 sustainability targets for reducing its environmental footprint while enhancing the health, safety and security of its guests and crew members, and ensuring sustainable business practices among its nine brands, business partners and suppliers.

Said Carnival Corporation's Chief Ethics and Compliance Officer Peter Anderson: "These investments in innovative green technology are part of a broader corporate strategy which includes an enhanced commitment to further improve the corporation's environmental performance and overall commitment to compliance."

The company has used other complementary technologies to achieve ecological advantages – including launching the world's first-ever cruise ships powered by liquefied natural gas (LNG), pioneering the use of Advanced Air Quality Systems on board its ships and promoting the use of shore power.

Added Anderson: "All of these efforts are part of our deep commitment to promoting safety, environmental protection and overall compliance."

About Carnival Corporation & plc

Carnival Corporation & plc is the world's largest leisure travel company and among the most profitable and financially strong in the cruise and vacation

industries, with a portfolio of nine of the world's leading cruise lines. With operations in North America, Australia, Europe and Asia, its portfolio features Carnival Cruise Line, Princess Cruises, Holland America Line, Seabourn, P&O Cruises (Australia), Costa Cruises, AIDA Cruises, P&O Cruises (UK) and Cunard.

Together, the corporation's cruise lines operate 105 ships with 254,000 lower berths visiting over 700 ports around the world, with 16 new ships scheduled to be delivered through 2025. Carnival Corporation & plc also operates Holland America Princess Alaska Tours, the leading tour company in Alaska and the Canadian Yukon. Traded on both the New York and London Stock Exchanges, Carnival Corporation & plc is the only group in the world to be included in both the S&P 500 and the FTSE 100 indices.

With a long history of innovation and providing guests with extraordinary vacation experiences, Carnival Corporation has received thousands of industry awards – including recognition by the Consumer Technology Association™ as a CES® 2019 Innovation Awards Honoree for the OceanMedallion™. A revolutionary wearable device that contains a proprietary blend of communication technologies, the OceanMedallion enables the world's first interactive guest experience platform transforming vacation travel on a large scale into a highly personalized level of customized service. The prestigious CES Innovation Awards honor outstanding design and engineering in consumer technology products.

Additional information can be found on www.carnival.com, www.princess.com, www.hollandamerica.com, www.seabourn.com, www.pocruises.com.au, www.costacruise.com, www.aida.de, www.pocruises.com, and www.cunard.com.

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