

CASE STUDY



New high-rise puts food recycling on site

By Iain Milnes

Waste management at multi-unit residential apartment buildings is an expensive headache, and among the different waste streams created by occupants, food waste is a particular challenge.

This is what faced Jack O'Brien, as he oversaw the development of an apartment building in Bracknell, about 25 km west of London in the UK. A master mason by trade and with experience restoring listed buildings,

O'Brien is dedicated to ensuring Comer Homes' developments exceed government-mandated standards for sustainability and efficiency.

"Waste management is not just about the direct costs associated with its disposal. At Comer Homes, we take a more holistic view to understand the burden it places on infrastructure, energy consumption, and carbon emissions," said O'Brien. "I believe we are on the brink of massive changes to this sector that go beyond considering

just heating, cooling, and energy costs – and that means we must develop a complete picture of the environmental and financial impacts of a building. Recycling waste food is a great example of where we can make a big difference."

That's why O'Brien was determined to make a difference at Royal Winchester House, a development of 338 apartments constructed on the site of 3M's historic Winchester House in Bracknell. An iconic building in its day, with 21 stories and a bold, monolithic look, the original Winchester House was an area landmark. In 2015, after remaining derelict for some years, it was finally demolished.

In its place, Comer Homes conceived a completely new building that includes apartments, along with a development that includes retail stores. Dubbed Royal Winchester House, the new residential high-rise was completed earlier this year and sits at the centre of a \$397 million redevelopment of Bracknell town centre.

Two options for food waste

In the UK residents in most multi-unit buildings are typically given two options: add waste food to their general garbage bin or grind it up in an in-sink waste disposal unit. From an environmental perspective, neither is a good solution.

Organic waste that ends up in a landfill generates harmful methane (with 84 times the global warming potential of carbon dioxide), while food added to the sewer through waste disposal units adds a significant load to wastewater treatment plants — again with greenhouse gas implications.

Reducing household food waste is a priority in the UK, which is a global leader in measuring food waste and supporting international food waste prevention projects. The Waste and Resources Action Programme (WRAP) works with Britain's governments, businesses, and communities to deliver practical solutions to improve resource efficiency.

WRAP's "Courtauld Commitment 2025" program brings together

organizations across the food system to make food and drink production and consumption more sustainable. At its heart is a commitment to identify priorities, develop solutions, and implement changes to reduce the carbon, water and waste associated with food and drink by at least one-fifth in 10 years.

Local action

At the local level, WRAP provides local authorities with information on the collection of household food waste as a means of diverting material from landfill or other residual waste treatment. Food waste management has been a hot potato at local city meetings, where council members have been held to account for the region's poor appearance in UK recycling performance rankings.

Despite the high startup costs for residential curbside pickup, local authorities have made progress toward offering residential waste food collection. This is planned for several communities near Bracknell.

In June 2019, Wokingham Borough Council announced it had already collected 1,000 tonnes of food waste since introducing the scheme in April, which picks up 23-litre curbside food waste containers and processes their contents at a local composting facility. Clearly, there's an appetite for dedicated curbside collection of waste food.

Self-motivation

Bracknell Forest Council does not currently offer residential waste food pickup, which meant Royal Winchester House food waste was destined for the landfill.

O'Brien's design team was eager to find a sustainable approach to waste food management that would lower the overall carbon footprint of the Bracknell development and reduce the burden on local landfills. They quickly ruled out in-sink waste disposal.

"While waste disposal units would divert organic waste from the local tipping sites, they added costly

complications to the mechanical and electrical network in the building," O'Brien said. "In addition to the costs of acquisition and installation, a regular maintenance plan would be needed. Further, there are costs associated with misuse and damage to the individual units and the building infrastructure. Instead, we decided to look for a long-term solution that would also support our sustainability goals."

On-site digestion

Instead of installing disposals in each apartment, the design team explored the idea of centralized organic waste collection. If the food waste could be diverted from the landfill and recycled locally, this would address Comer's sustainability objectives.

To avoid dependence on municipal composting facilities, O'Brien and his team developed an approach that would process all waste food on site. This resulted in a residential recycling plan consisting of colour-coded waste caddies for each apartment, a communal waste collection point, and two Power Knot LFC biodigesters.

The LFC biodigester is a practical alternative to municipal waste food recycling. It employs a series of natural processes by which micro-organisms break down biodegradable material in the presence of oxygen. The LFC environment accelerates the digestion of most food products within 24 hours by using a proprietary mixture of microbes and enzymes.

The two stainless steel LFC biodigesters installed in the concierge area of the Royal Winchester House reduce the expense, inconvenience, and mess of storing residential waste food by completely digesting residents' waste food – continually. Almost all waste food from the apartments, including fruits, vegetables, meat, fish, cheese, bread, rice, and pasta can go into the LFC biodigesters – and the machines can compost both raw and cooked foods.

Residents bring their caddies down to the communal concierge area, where they are emptied into the LFC



Almost all food waste can be handled by the two digesters.

biodigester, in exchange for clean caddies. Each of the LFC biodigesters silently and hygienically processes up to 400 kg of waste food per day, transforming it into grey water that is then sent to the local wastewater treatment facilities.

A screen inside each unit ensures it conforms with local wastewater discharge regulations. Each biodigester reports the amount of waste ingested on a touch screen and also sends that data to the cloud. Detailed information about usage and other statistics can be accessed anywhere, enabling the sustainability team to monitor waste outputs, and how much greenhouse gas has been negated.

Leadership

Comer Homes's vision for zero organic waste has come alive at Royal Winchester House. The Bracknell project may well serve as a blueprint for other developers in the UK and North America.

Meanwhile, a landfill near Bracknell can breathe a huge sigh of relief – methane free. ☺

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