Consumer Food Waste to Energy

The Green Era Campus project addresses the challenge of food waste disposal in municipal solid waste landfills by diverting it into a circular system that generates renewable energy and community benefits. When food waste is landfilled, it decomposes quickly and produces methane, much of which escapes capture and contributes significantly to global warming. The Green Era 83rd Street Campus in Chicago, IL, works with grocery stores, major retailers such as Walmart, and composting programs to divert pre- and post-consumer food waste to its facility, where it is processed into renewable natural gas and injected into the local gas grid on-site. In partnership with Urban Growers Collective, Green Era also ensures that compost generated as a byproduct of processing is used to grow food for the local community.

This collaboration supports agricultural education, expands access to fresh produce in an area with limited grocery options, and creates a model that links waste diversion, clean energy production, and community food resilience.

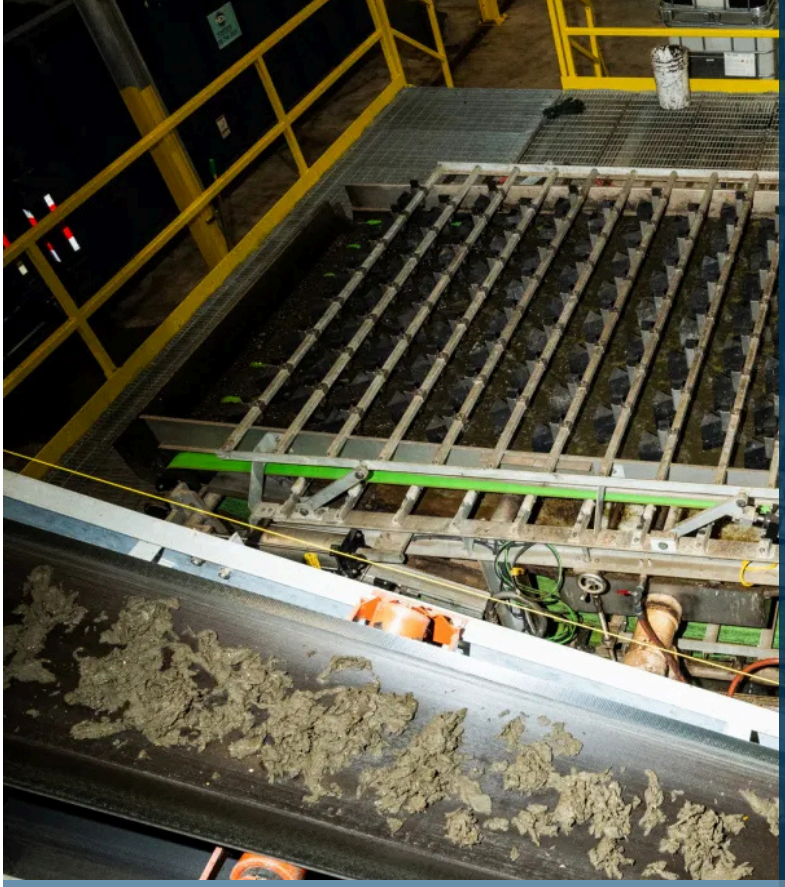
REDUCE

RECOVER

CHICAGO, ILLINOIS, USA

WASTEWATER

wef | CASE STUDY



CHALLENGES FACED

Securing financial incentives required significant coordination. Maintaining stable digester chemistry during startup was challenging because of variable food waste inputs. The diversity of pre- and post-consumer food waste streams required robust mechanical pretreatment systems capable of handling mixed substrates. Existing equipment, including screens, hammer mills, pulpers, and cyclones, faced limitations in removing contaminants such as plastics, grit, and glass, highlighting opportunities for further technological improvement in this area.

TECHNOLOGIES & SOLUTIONS USED

The project utilizes an integrated system to convert food waste into renewable energy and usable byproducts. Food waste is received and separated to remove packaging and nondigestible materials, which are diverted to recycling or landfill. The remaining biomass is blended and stored before undergoing anaerobic digestion, where it is heated and mixed to produce biogas. This biogas is upgraded via a PSA system into biomethane and CO_2, with biomethane injected into the local pipeline as renewable natural gas. The digestate is dewatered, with solids repurposed as compost and liquids sent to a local Water Resouce Recovery Facility for further treatment.

IMPACT & INSIGHTS

The Green Era 83rd Street facility offsets 52,700 tons of carbon dioxide per year by diverting food waste from municipal solid waste landfills. It partners with the nonprofit Urban Growers Collective (UGC), which utilizes compost produced from on-site food waste processing to grow food for the local community. The UGC also provides food and agricultural education in an area with limited access to fresh groceries. Operating seven farms, including one on the Green Era campus, UGC enables community members to harvest fresh produce at no cost.

LESSONS LEARNED

- The dewatering system chosen for these types of facilities is critical: screw presses or centrifuges are the most commonly used technologies in food waste digestate dewatering.
- When separating recyclable material, the less shredding that occurs during mechanical food waste separation, the more recyclable material can be removed and sent to a recycling facility rather than a landfill.
- Cleaning recyclable material is important for recycling companies to accept the maximum amount of recycled materials.

> **The Green Era Campus demonstrates how cities can build circular infrastructure that reduces landfill waste, produces renewable energy, supports local agriculture, and creates meaningful community benefits.**

Water Environment Federation

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