

LIFE CYCLE ASSESSMENT OF ON-SITE ACCELERATED FOOD WASTE COMPOSTER

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Canteen and catering food waste represent a challenge in waste management since they contain a large part of water and can be subject to biological processes during the waste management chain, especially during storage. Different solutions exist to manage this organic waste, for instance local and centralized composting, anaerobic digestion, or co-incineration with municipal waste. Except for local composting, these methods need to collect and transport food waste to be processed, which means transporting a lot of water.

The Life Cycle in Practice (LCiP) (LIFE12 ENV/FR/001113) project helps SMEs to reduce the environmental impacts of their products and services across the entire life cycle. Within the frame of this project, the environmental impact of the Eco-Cleaner system is evaluated with the standardized life cycle assessment (LCA) methodology.

Eco-Cleaner (EC) is a stand alone accelerated system that can transform food waste in valuable compost in only 24 hours. It is designed by GET Innovation (Saintronic factory and APB Environnement laboratory) (<http://www.get-innovation.fr/>). It can be declined in different capacities, from family size (about 1-2 kg/days of food waste) to large communities of 1300 place settings (up to 700 kg/days). EC technology is based on a permanent control of the ratio of humidity and temperature to optimize fermentation rate of food waste by a special consortium of more than thirty thermophilic bacteria. Waste reduction is about 90% and compost is sanitized to ensure the destruction of active parasites, insect eggs and germs. EC compost is dry (80-90% siccidity level), and it has a quite high nitrogen content (about 3-4% on dry matter) and is rich in organic matter. Thanks to an activated carbon filter, it is odourless and has no noxious gas emission. Since it's dry, this compost can be stored without further degradation, and its transport has a reduced environmental cost.

The functional unit is the composting of one ton of food waste. The inventory includes the machine itself, its use, its refitting during life time and its end of life. Avoided chemical fertilizers consecutive to compost application are considered as system expansion. The most impacted category is abiotic depletion due to the metals the EC is made of. Except for abiotic depletion, EC food waste processing is better than centralised compost, especially when considering global warming.

Specific process data are processed in SimaPro 8 software, using Ecoinvent database for additional generic data, and analyzed with the CML IA method.