Food Waste: from diagnosis to solutions

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According to a report from the Food and Agriculture Organization of the United Nations (FAO), the world loses or wastes nearly a third of the food produced for human consumption. This fact has sent shock waves across the globe and led to calls for action by world leaders and civil society groups. What magnifies the concern is that the food loss and waste is occurring at a time of increasing food prices and worsening food insecurity for many. The issue is of high importance for FAO and governments in their efforts to combat hunger, food insecurity and malnutrition, at the same time enabling inclusive and efficient agricultural and food production systems.

During agricultural production, post-harvest handling and storage, processing, distribution and consumption of food, large amounts of wastage are accumulated. Food losses and waste have a negative impact on the environment since they represent a waste of production factors and energy resources, and contribute to greenhouse gases emissions.

Anaerobic digestion is a process that involves the breakdown of biodegradable organic material, in the absence of oxygen, by micro-organisms. It is broadly used to treat organic wastes, such as manures, energy crops, as well as, domestic and commercial food waste. Typically, two streams are produced: biogas and digestate.

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The biogas is mainly a mixture of 60% methane (CH_4) and 40% carbon dioxide (CO_2). The biogas can be combusted directly in a combined heat and power (CHP) plant to generate electricity and heat to power on-site equipment, and the excess electricity can be exported to the National Grid. Alternatively, it can be upgraded to biomethane - through the removal of carbon dioxide - that leaves a product similar to natural gas (with greater than 95% methane content), which can be injected in the gas grid and be used as a **vehicle fuel.**

"Gaseous renewable energy carriers, such as renewable 'green gas' can have a considerable impact on future energy systems, and play a key role in decarbonising heat and transport."

The digestate can be used as a fertiliser, as it is rich in nutrients such as nitrogen, phosphorus and other elements required for healthy plant growth and fertile soil. There are strict standards governing the materials that can be used to produce quality compost and biofertiliser for use in agriculture. These are defined in the British Standards Institution's Publicly Available Specification 100 (PAS 100) for compost and PAS 110 for biofertiliser.

Additionally, composting can be used to treat food and garden waste mixtures. An efficient composting unit ensures that composting takes place in an enclosed environment, with precise temperature control and monitoring. Facilities which process organic waste, according to BSI PAS 100 and the Quality Protocol for compost, produce products that are no longer considered a waste by the Environment Agency.

As modern society moves towards an increasing level of urbanisation, accompanied by a growing population that constantly demands higher consumption of goods and greater energy needs, the topic of waste management and energy/ material/nutrient recovery from waste becomes central for future scenarios of sustainable development.

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