

Project Design Phase

Proposed Solution

Date	03 November 2025
Team ID	NM2025TMID01374
Project Name	To Supply Leftover Food to Poor
Maximum Marks	2 Marks

Proposed Solution: Food-to-Power System

The proposed solution is to develop an **eco-friendly “Food-to-Power” system** that collects and converts leftover food waste into renewable energy. This system utilizes the **anaerobic digestion process**, where microorganisms break down organic food waste in the absence of oxygen to produce **biogas** (mainly methane and carbon dioxide).

The biogas generated can be:

- **Used directly** for cooking, heating, or lighting.
- **Converted into electricity** through biogas-powered generators or fuel cells.
- **Upgraded** to biomethane and supplied to local energy grids.

Key Components

- **Food Waste Collection Units** – Smart bins at homes, restaurants, and institutions for segregating leftover food.
- **Transportation Network** – Vehicles or pipelines to deliver collected waste to the processing plant.
- **Anaerobic Digestion Plant** – Converts organic waste into biogas.
- **Energy Conversion System** – Converts biogas into electricity or thermal energy.
- **Storage & Distribution** – Stores biogas/electricity and supplies it to consumers or the grid.
- **By-product Utilization Unit** – Processes digestate into biofertilizer for agricultural use.

Expected Outcomes

- Reduction in landfill waste and greenhouse gas emissions.
- Generation of renewable, low-cost energy.
- Sustainable waste management for urban and rural areas.
- Creation of green jobs and promotion of circular economy principles.



Conclusion:

The **Food-to-Power system** provides an innovative and sustainable approach to addressing two major global challenges — **food waste** and **energy scarcity**. By converting leftover food into renewable biogas or electricity, this solution not only minimizes environmental pollution and landfill accumulation but also contributes to the generation of clean, affordable energy.

Implementing such systems in communities, institutions, and industries can significantly reduce greenhouse gas emissions, promote efficient waste management, and support the transition toward a **circular and green economy**.