Project Proposal:

Interactive Visualization of the College Farm Digester Process

# Project Title:

GlooEco: Interactive Visualization of the Digester System at the College Farm

# Purpose of the Project

The purpose of this project is to promote public awareness and understanding of the biogas digester system currently implemented at the college farm. By transforming complex scientific principles and environmental data into interactive and artistic website design, this project aims to educate a broader audience about sustainable waste treatment and carbon neutrality initiatives on campus, and also make an effect on promoting the college farm.

# Project Overview & Structure

I divided this project into three main components that represent the full process of the digester system—from biological mechanisms to public engagement:

## Part 1: Fundamental Principle Research

- Content Scope:  
 - Origin of input waste: farm manure, food scraps.  
 - Biological reactions explanation.  
 - Resulting output: biogas, methane, CO₂.  
- Output Form:  
 - Educational modules and infographics.  
 - Collage-based artistic renderings for visual explanation.  
- Goal: Translate scientific mechanisms into more acceptable reading and understanding context for general audiences.

## Part 2: Visualization of the Digester Process

- Tools Used: Arduino sensors + TouchDesigner.  
- Design Methodology:  
 - Use real-time or simulated sensor data to show transformations inside the digester.  
 - Animate stages of microbial breakdown and gas release as flowing abstract visuals.  
 - Create an immersive, animated “reaction pathway” using generative art.  
- Goal: Offer audiences an aesthetic sense of the system’s internal complexity and beauty. And make the process more attractive to audiences and make them feel interested.

## Part 3: Visualization + Interactive Output of College Farm

- Content Elements:  
 - Accumulated output data (carbon reduction(neutralization), biogas produced).  
 - User-inputted data that triggers responsive environmental visuals.  
- Interactive Features:  
 - Users input personal carbon-related behaviors; the site visualizes how the digester offsets them.  
 - Color- or pattern-based visualization that symbolically “neutralizes” carbon impact.  
- Design Style: Floating modular blocks, colorful flowing maps, clickable navigation.

# Final Output: A Web-Based Interactive Platform

The end product will be a fully developed interactive website structured into three sections:  
1. Introduction & Explanation Page: Breakdown of research content and principles.  
2. Dynamic Project Visualization: Artistic renderings and animations of the digester in process.  
3. Interactive Data Interface: Carbon offset simulations, live visualizations of digester output, and community engagement tools.

# Project Goal & Broader Impact

This project ultimately aims to:  
- Translate environmental technology into an accessible digital experience.  
- Bridge the gap between science, art, and public understanding.  
- Promote sustainable practices and carbon awareness through interactive media.  
- promote college farm's digester as a model of circular agriculture and climate action.  
  
By bringing together data science, interactive design, and creative storytelling, this project becomes a model for future environmentally focused-educational tools.