Provisional Patent Application – Integrated Waste-to-Resource System

Title: Integrated Waste-to-Resource System with CO₂ Capture and Algae Oil Production  
  
Inventor: Michael Allen Wilcox  
  
Description:  
This invention is a closed-loop system designed for a town of 50,000 people, integrating waste processing, sustainable housing, vehicle construction, carbon capture, and biofuel production into a singular operating framework.  
  
Core Components:  
1. Sentinel Sorter: An AI-driven system capable of processing 44,712 tons of municipal solid waste per year. It utilizes robotic arms, ultrasonic sensors, and computer vision to sort 60–90% of recoverable materials (plastics, metals, concrete).  
  
2. 3D Printed Homes: Modular housing units constructed using recovered waste materials. With four large-format printers, the system produces 200 homes per year, priced between $9,000–$13,000.  
  
3. Modular Vehicles: A forge system constructs 200 hybrid/electric vehicles per year using salvaged materials. Vehicles include an integrated water-based CO₂ filtration system to capture 30–60% of emitted carbon per mile.  
  
4. CO₂ Capture System: Exhaust gases pass through a rainwater chamber with nano-bubbler injection, dissolving CO₂ into water. An alkaline bed neutralizes the resulting carbonic acid, producing a mineral slurry. This output feeds the algae oil production loop.  
  
5. Algae Farms: A 20-acre algae cultivation facility uses the captured CO₂ to grow biomass, refined into 1,904–4,047 barrels of bio-crude, diesel, and jet fuel per year. Half the output is used locally; half may be sold at $65–$105 per barrel.  
  
Revenue Summary (Year 1):  
- Recovered Materials: $13.25M  
- Homes (200): $1.8M–$2.6M  
- Vehicles (200): $1.1M  
- Algae Oil: $161K–$344K  
- Carbon Credits: $600–$1,500  
- Projected Total: $16.3M–$22.3M  
  
Novelty:  
This is the first municipal-scale system to integrate AI-driven waste recovery, modular home and vehicle production, real-time mobile CO₂ scrubbing, and biofuel generation in a closed loop. This reduces pollution, maximizes resource efficiency, and generates significant revenue while addressing housing and energy insecurity.  
  
This document represents a provisional patent application filed for the purpose of securing the priority date and outlining the functional architecture of the invention prior to a full non-provisional patent.  
  
Filed: May 19, 2025