UC Davis Renewable Energy Anaerobic Digester (READ)

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UC Davis Sustainability Initiative-Zero Waste by 2020

- Closed university landfill two years ago
- Developed Renewable Energy Anaerobic Digester (READ) for converting all organic waste into energy and soil/fertilizer products
- Developed Zero Net Energy West Village with solar and bioenergy supply meeting the energy needs

UC Davis Renewable Energy Anaerobic Digester

- Treats 20,000 tons per year of mixed organic wastes
- Combines biogas and landfill gas to generate 5.6 GWh electricity per year
- Partnership between CleanWorld, UC Davis, U. S. Department of Energy and the California Energy Commission

Completed in January 2014

High Solids Anaerobic Digestion Technology Developed at UC Davis

- Theromophilic digestion (three stage)
- Capable of treating a variety of organic solid waste
- Fast digestion rate and short retention time
- High biogas energy output
- Destruction pathogens in waste, producing safe biofertilizers

Business Arrangement Between UC Davis and CleanWorld

- **Site license agreement**
  - Facility owned and operated by CleanWorld
- **Power Purchase Agreement**
  - Campus provides landfill gas
  - Campus purchases electricity from CleanWorld
    - Currently ≈ 8¢ per kWh – WAPA rate
  - Campus pays CleanWorld tipping fees
    - Currently - $31 per ton for Yolo County Central Landfill

Source: Sid England, UC Davis

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READ Project Location

SOURCE: Google Earth – May 2012

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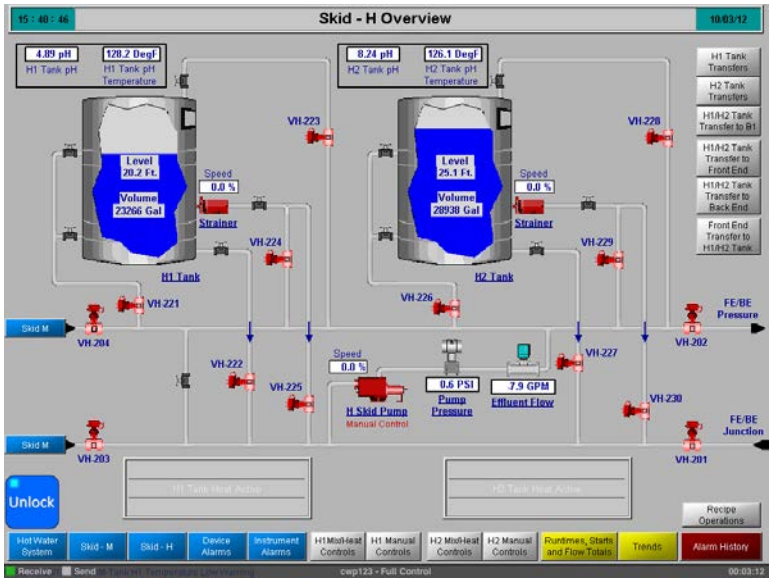
CleanWorld Technology: Low Capital Costs

- Smaller footprint, **less real estate**
- Pre-fabricated systems **reduce labor cost** and **construction time**
- Modular design for **easy scale-up** and **minimal site-specific engineering**
- Exceeds stringent California **environmental permitting** standards
- Operational in 4-6 months

CleanWorld Technology:
Low Operating Costs



- **High system stability** regardless of fluctuations in loading rates and waste composition
- **No fresh water needed**
- Remote monitoring/operation **reduces staff requirements**

CleanWorld Technology: Preprocessing and Feedstocks

- Handles both liquid and solid feedstock
- No receiving station enclosure needed
- Minimizes odors
- Maximizes recycling potential by removing inorganic materials before processing

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READ Project Benefits

- **Increase renewable energy supplies**
  - 5.6 million kWh per year
- **Reduce greenhouse gas emissions**
  - Electricity ≈ 4,000 metric tons CO_2e
  - Feedstock emissions ≈ 6,000 metric tons CO_2e
  - May be able to count some credit towards cap-and-trade allowances
- **Reduce waste sent to municipal landfills**
  - 50 tons/day from the region (20,000 tons/year)
  - 20 tons/day from campus

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UC Davis READ Project Launch on Earth Day, April 22, 2014

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UC Davis Biodigester Launch on Earth Day, April 22, 2014

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