

# Inclined Rotary Gasifier

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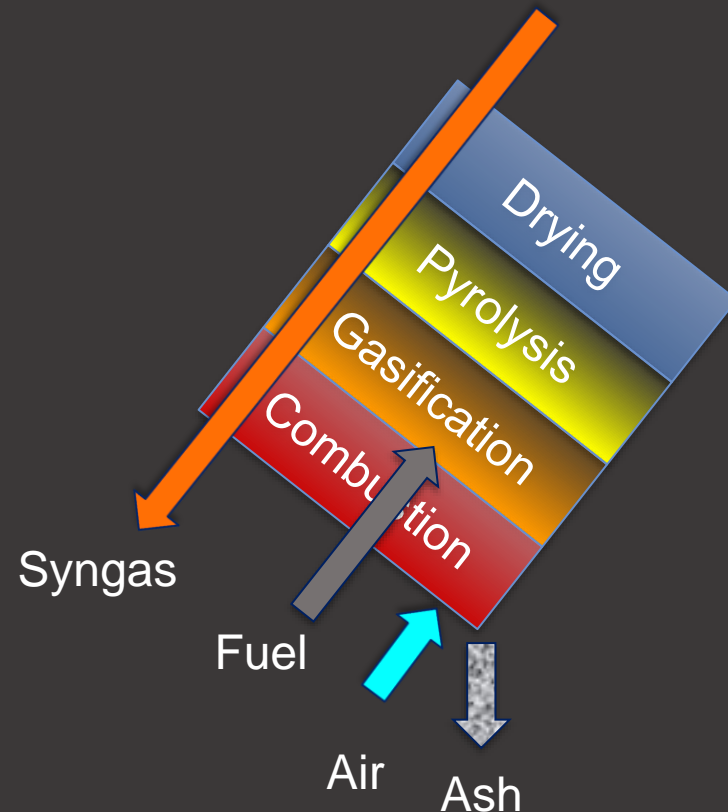
# Objective

- Create a design for a deployable waste-to-energy-system, with the following criteria:
  - Based on gasification
  - One to three tons/day capacity, with minimal sorting
  - Self-powered, with net-positive exportable electricity
  - Size to fit two, 20-ft containers



# Technical Approach – Rotary System

- System works like a modified updraft gasifier
- Waste fed from bottom, placed at hot, burning char layer
- Syngas collected through concentric tube, not directly exposed to char bed
- Rotates at ~1rpm



# Main Reactor, prototype



# Compact and flexible system

- Low parasitic load
- Simple and light weight
- Small reactor and process vessels
- Minimal or no feedstock preparation
- Process dripping wet feedstock
- Able to process soil, stones, glass, and metals mixed with feedstock
- Safe (low hydrogen production)
- High energy syngas from cracking heavy oil into gasoline and diesel.

# Version 2, assembled

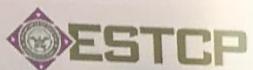


- Feed hopper
- Shredder



# Control Screen

ESTCP SCADA - Gasifier



Rotary

Waste to Energy

Gasification System

Current Display: Gasifier

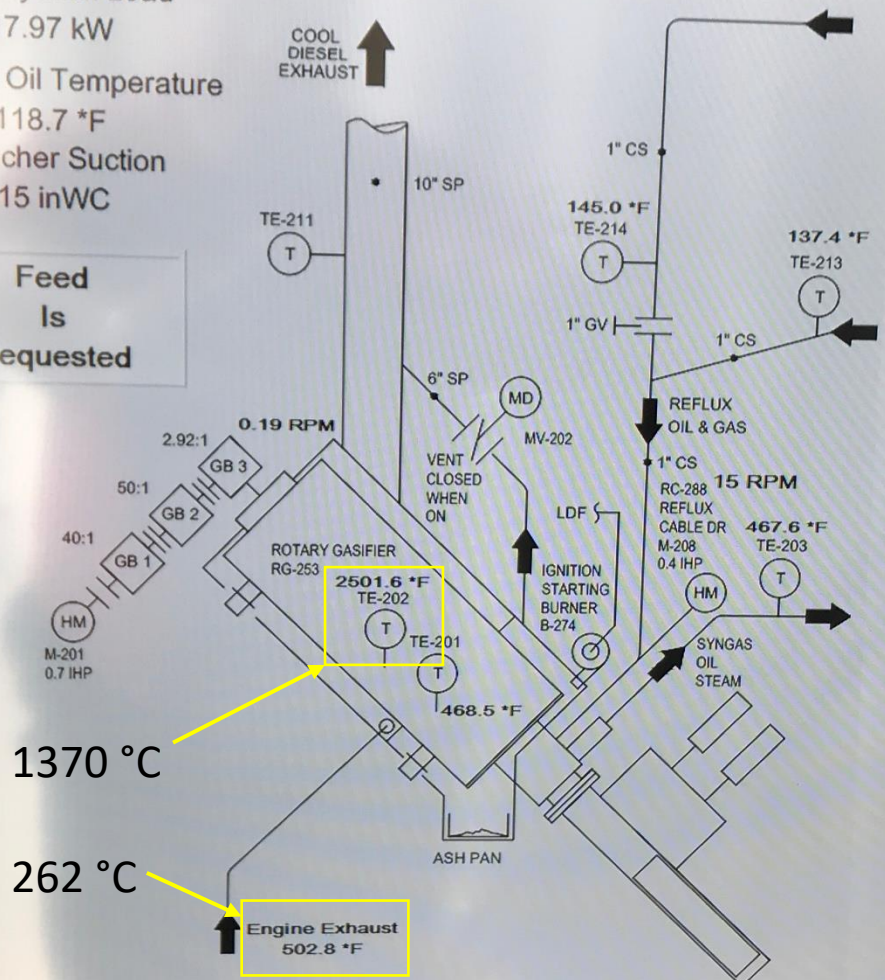
System Navigation

Total System Load  
17.97 kW  
Hydraulic Oil Temperature  
118.7 °F  
Quencher Suction  
-15 inWC

Feed  
Is  
Requested

Gas Flow Setpoint  
20 SCFM

Gas Flow Actual  
21 SCFM



WARNING: HEARING  
PROTECTION REQUIRED  
WITH DOORS OPEN

WARNING: HEARING  
PROTECTION REQUIRED  
WITHIN 3FT EXCEPT AT  
OPERATORS STATION

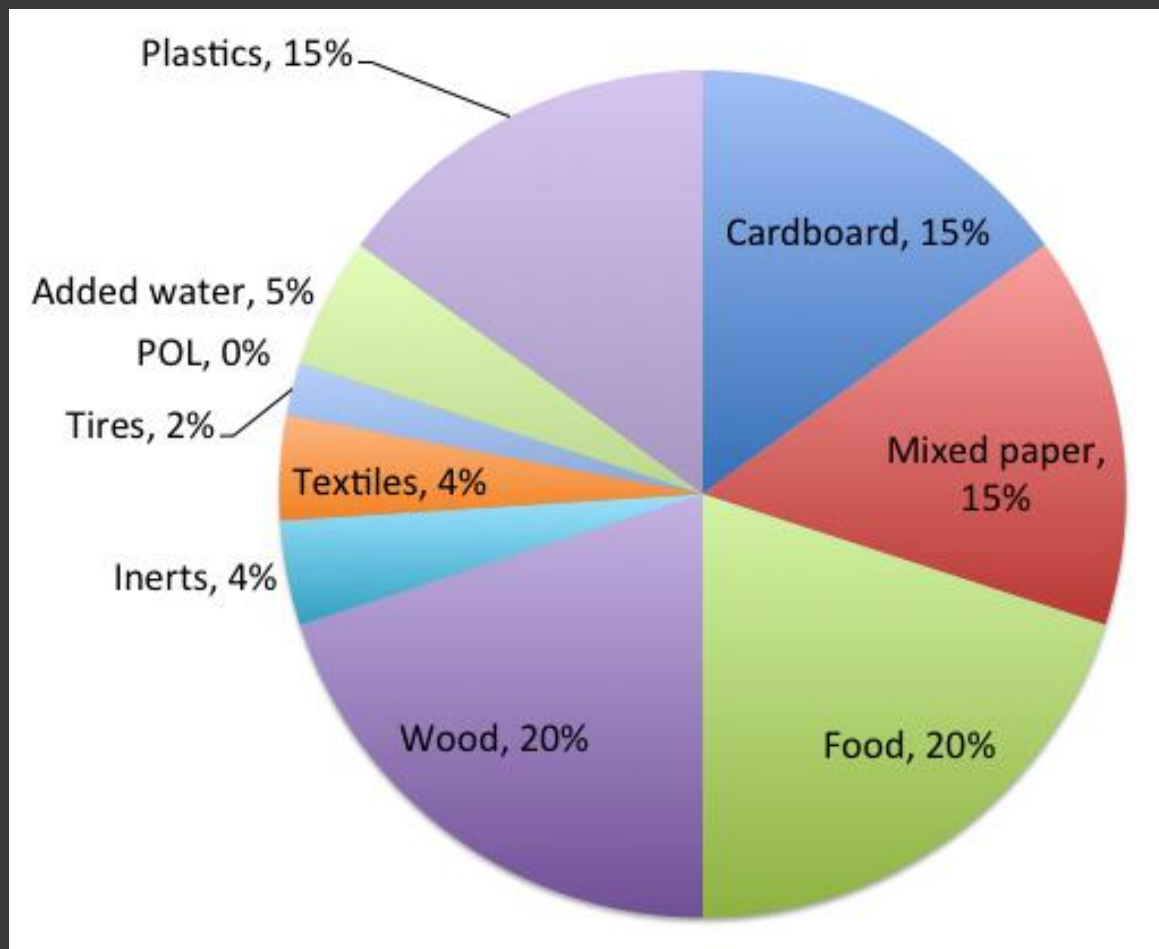
CAUTION  
STAND  
HEAVY  
ON TOP

OIL DRAIN

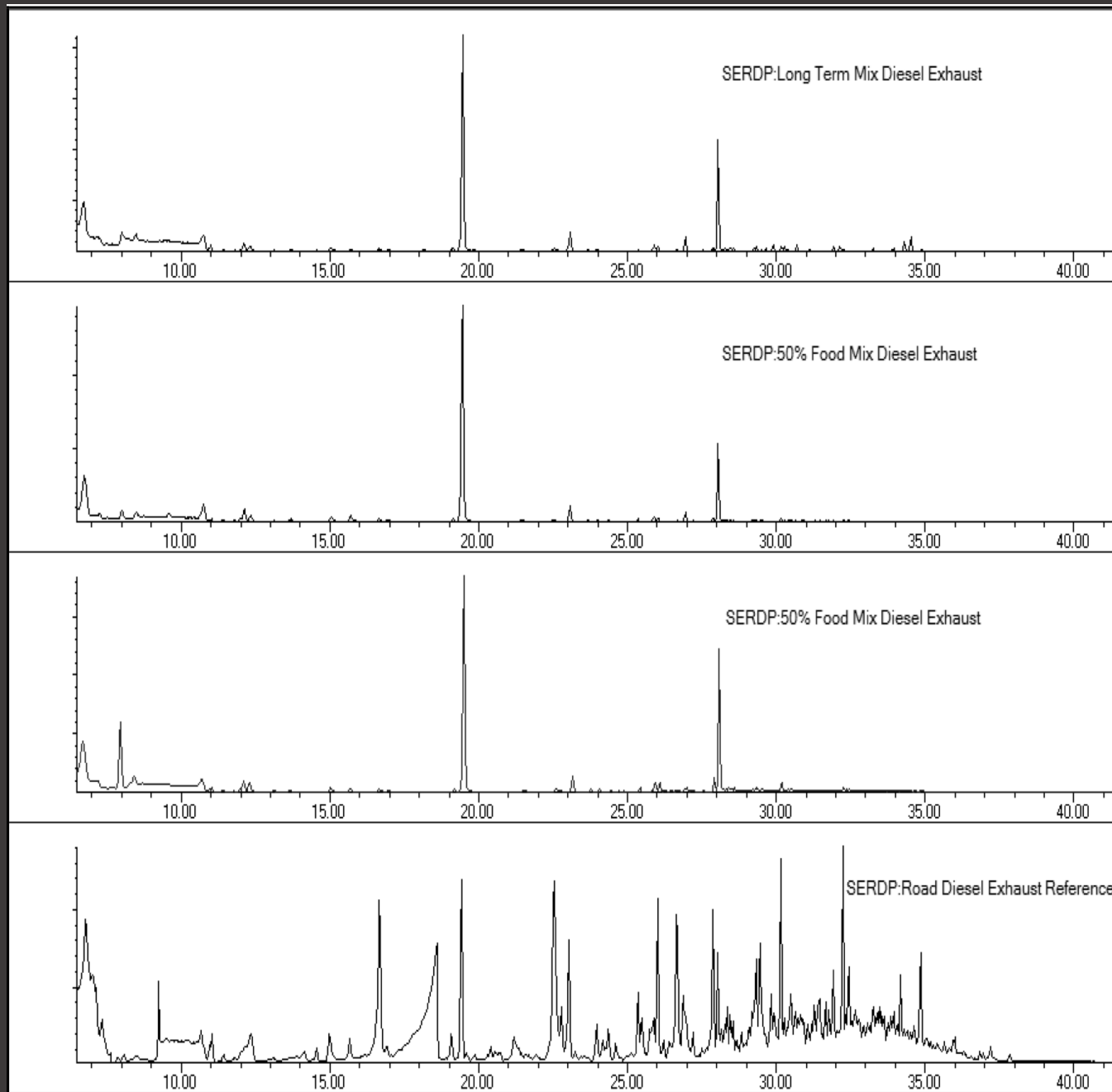


# “Standard” waste composition

- Based on LIA field survey, 2013
- Variations to include
  - 50% food
  - 50% plastics
  - 50% POL



# Exhaust gas comparison



# Status Update

- SERDP project WP-2211
  - Prototype development and testing
  - Completed
- ESTCP project WP18-5127
  - Version 2, containerized system constructed and tested
  - Waiting (still) on approval from West Point DPW
- Pentagon Energy Expo, 21-22 Sept.
  - Version 2 system displayed at JBMHH
  - 3D printed model of Version 3 on display at Pentagon