

MOTIVATION

- Convert agricultural waste into high-value fuel chemicals
- Utilizing largest corn-processing center in Southeast Asia
- Philippine law dictates that 2% of diesel must come from biomass sources
- Diversify country's energy portfolio

BACKGROUND

- Corn stover
 - Makes up half of all corn crop yield
 - Consists of stalk, husk, and leaf
 - Usually replowed into soil
- Fast pyrolysis
 - Rapid heating of biomass to high temperatures (400-600 °C) and short residence times
 - Forms fuel gases, liquid bio-oils, and solid char products
- Hydroprocessing
 - Deoxygenates bio-oil compounds into lighter, more useful ones
 - Saturates hydrocarbons with hydrogen

LOCATION

Pasig City, Philippines



Largest Corn Processing facility in South east Asia

Hydrogen Source & Our plant

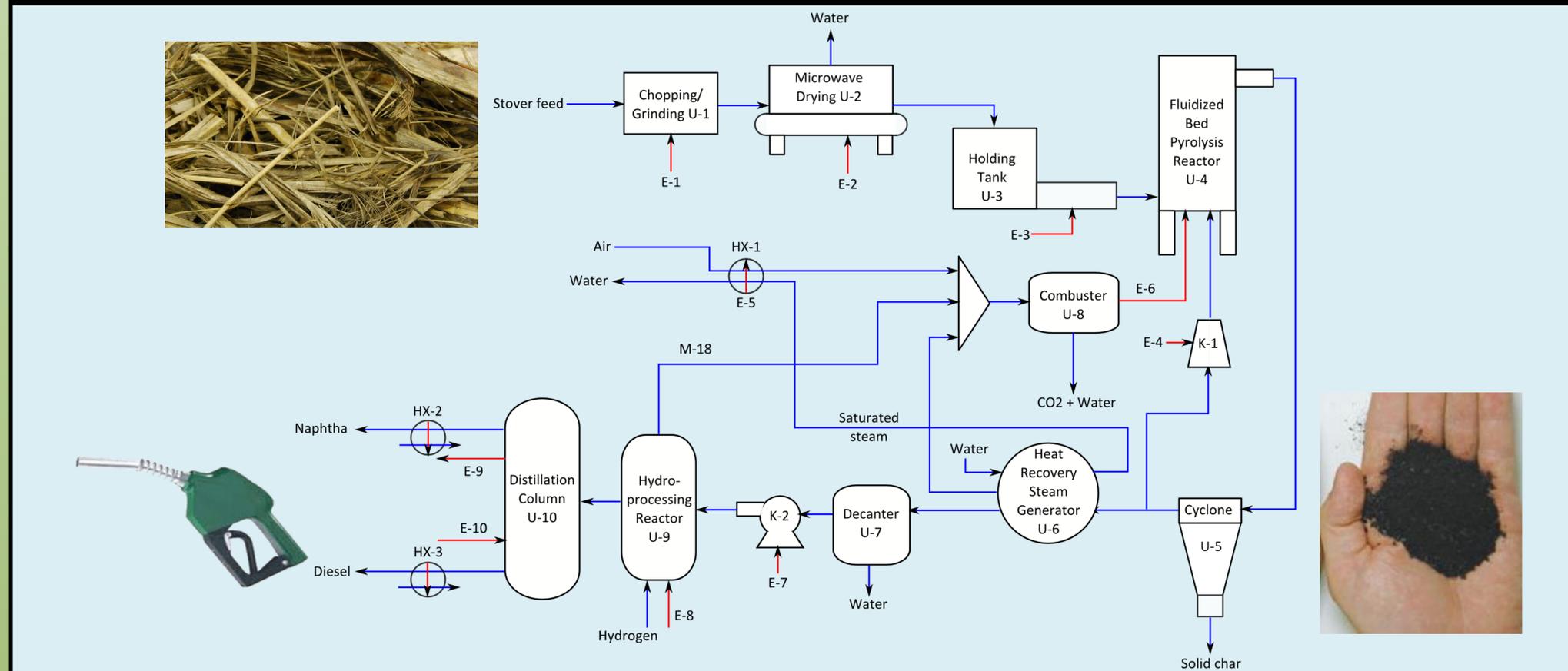
Diesel Market

Naphtha Market

Reina Mercedes Corn Processing Center is the biggest corn processing plant in Southeast Asia.

Corn Stover feed: 200,000 metric tons / year

PROCESS FLOW DIAGRAM



PROCESS DETAILS

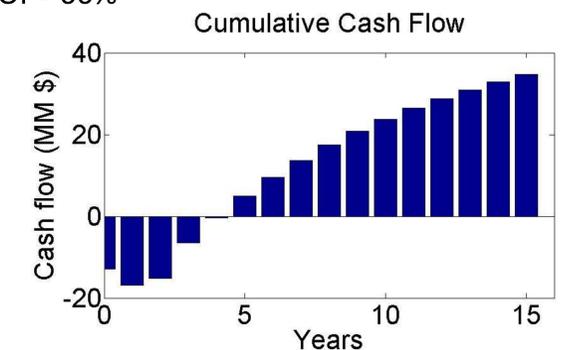
- Raw corn stover contains 15% water by weight, dried to 7%
- Pyrolyzed in circulating fluidized bed reactor at 480 °C and atmospheric pressure for residence time of <2 seconds
- Bio-char separation using cyclones
- Product gases quickly quenched to condense out liquid bio-oils, heat extracted from gaseous stream used to preheat dried stover prior to pyrolysis
- Hydrogen used to saturate liquid bio-oils in hydroprocessing unit, producing high-valued hydrocarbons
- Hydrocarbon products separated into naphtha and diesel via distillation

PRODUCTION RATES

- 200,000 bbl/year of naphtha
- 140,000 bbl/year of diesel fuel
- 27,000 tonnes/year of bio-char, sold with fertilizers

ECONOMIC ANALYSIS

- NPV over 15 years is \$35MM
- 10% discount rate
- ROI = 66%



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