Biomass to Drop-in Fuels: Demonstration Capability of Rentech's BioEnergy Center of Excellence

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$150 Million Fully Integrated Biomass Synthetic Fuels, Power and Chemicals Facility

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Introduction to Rentech

- Established in 1981
- Employees: 250+
- Revenue: ~$200 million
- Publicly-traded: NYSE AMEX: “RTK”
- Locations:
  - Los Angeles, CA (Headquarters)
  - Commerce City, CO (BECE location)
  - Atlanta, GA
  - Natchez, MS
  - Honolulu, HI
  - East Dubuque, IL
- 30 years of technology operating experience
- 40 years of syngas production experience
- Nitrogen fertilizer facility: 600K tons/y
- BioEnergy Center of Excellence “BECE”
  - $150 Million Fully Integrated Biomass Synthetic Fuels, Power and Chemicals Facility

Clean Energy Technologies

	Rentech-ClearFuels Biomass gasification	Rentech-SilvaGas Biomass gasification	Rentech Process Synthetic Jet / Diesel
Feedstocks:	Finely ground virgin biomass: sugarcane bagasse & wood	Wood, agricultural residues, straw, switch grass, & energy crops	Syngas from any carbon-bearing materials
Products:	Hydrogen, Optimized for fuel	Power; fuels & power	Hydrocarbons for synthetic fuels; specialty chemicals
Readiness:	Proven at pilot scale; To be proven at demo scale at PDU w/ aid of $23M DOE grant	Proven at commercial scale; Deployable today	Proven at demonstration scale; Deployable today

Energy Technology: Integrated Value Chain

Bagasse

Ag Waste

Grass

Switchgrass

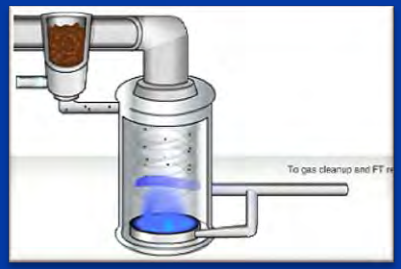
Wood / Timber

Other Biomass

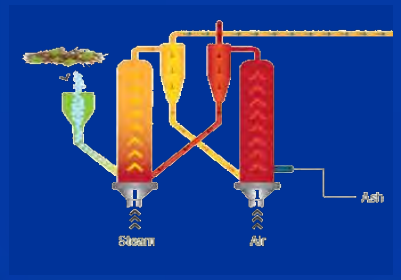
Natural Gas

Rentech's Biomass Gasification Technologies

Rentech-ClearFuels

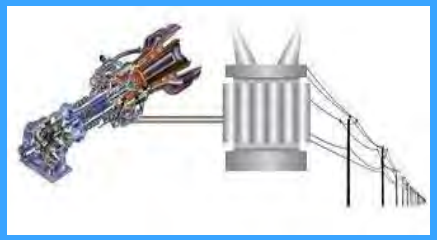


Rentech-SilvaGas



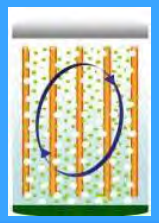
Steam Methane Reformer
(third party)

Combined Cycle Power
(third party)



Cellulosic Fuels Technologies
(third party)

Rentech Fischer-Tropsch Process



Renewable Power

Renewable Fuels

Upgrading

uop

Energy Products

Certified Fuels from Rentech's FT Technology

Diesel: Audi 1000 Mile Drive

Certified Jet: United Airlines Flight

Lower tailpipe emissions

Low carbon footprint & cellulosic RINs

Other Cellulosic Fuels

- Cellulosic ethanol and other fuels from our biomass gasification technologies
- Fuels can qualify for cellulosic RINs

Renewable Hydrogen

- Produced from biomass by Rentech-ClearFuels gasifier

Renewable Power

- **Renewable baseload** power; no backup required
- **Close** to interconnection and transmission

BECE: BioEnergy Center of Excellence

- Integrated systems for BioFuel, Renewable Chemical, and Power Production; Biomass Gasification; Hydro-Processing; Catalyst Development and Testing Labs for Collaborative Technology Advancement(s)
  - Platform for development of BioEnergy technologies for commercial deployment
  - Designed to be highly flexible – “Plug and Play” for innovative new technologies
  - Produces ultra clean, certified aviation and diesel fuels, naphtha, power and chemicals
  - $23 million DOE grant for a Rentech-ClearFuels biomass gasifier with an additional $13 million invested by Rentech
- Produced Ultra-clean diesel & aviation fuels and naphtha
  - Diesel fuel meets ASTM, D97566 and EN 590 specs
  - “Drop in” fuels
- Testing syngas and fuels from variety of feedstocks:
  - Wood Waste
  - Corn Stover
  - Natural Gas
  - Bagasse
  - MSW/RDF
  - Others
- $150 million technology and R&D center
  - 70 scientists, engineers, technicians and operators
  - 3 catalyst development and evaluation labs
  - 1 analytical and fuels testing lab
  - 1 wax/catalyst separation technology lab

Rentech-ClearFuels IBR Project

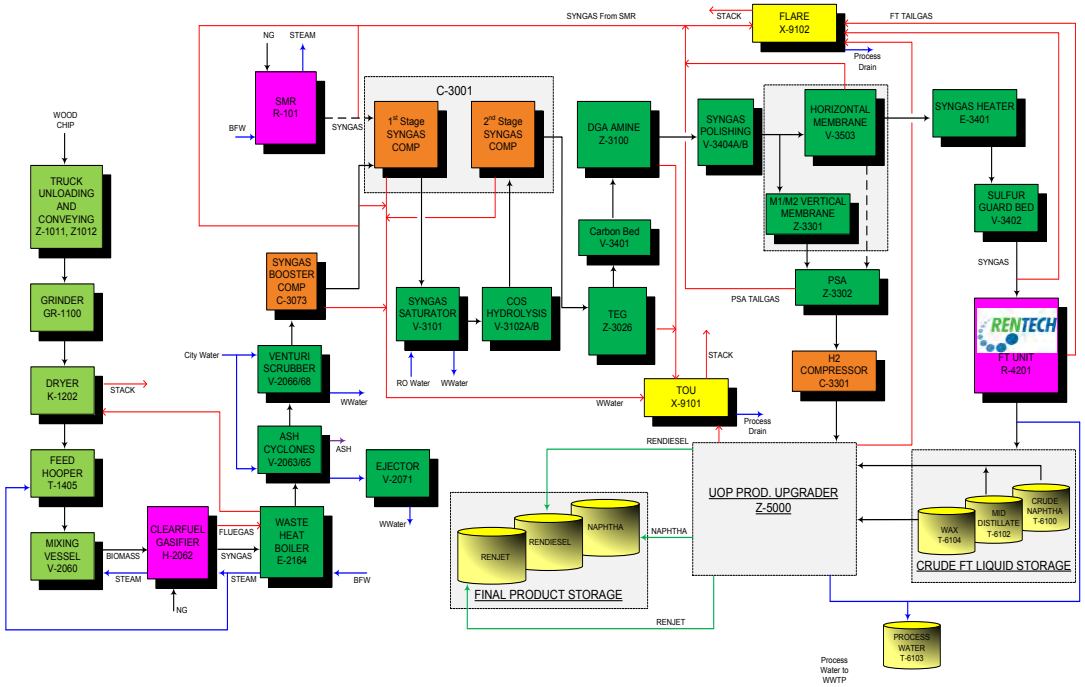
- A strong project team
  - URS Corporation; Linde/Hydro-Chem; Hawaiian Electric; National Renewable Energy Lab & Hawaii Natural Energy Institute
  - On-time and on-budget project execution

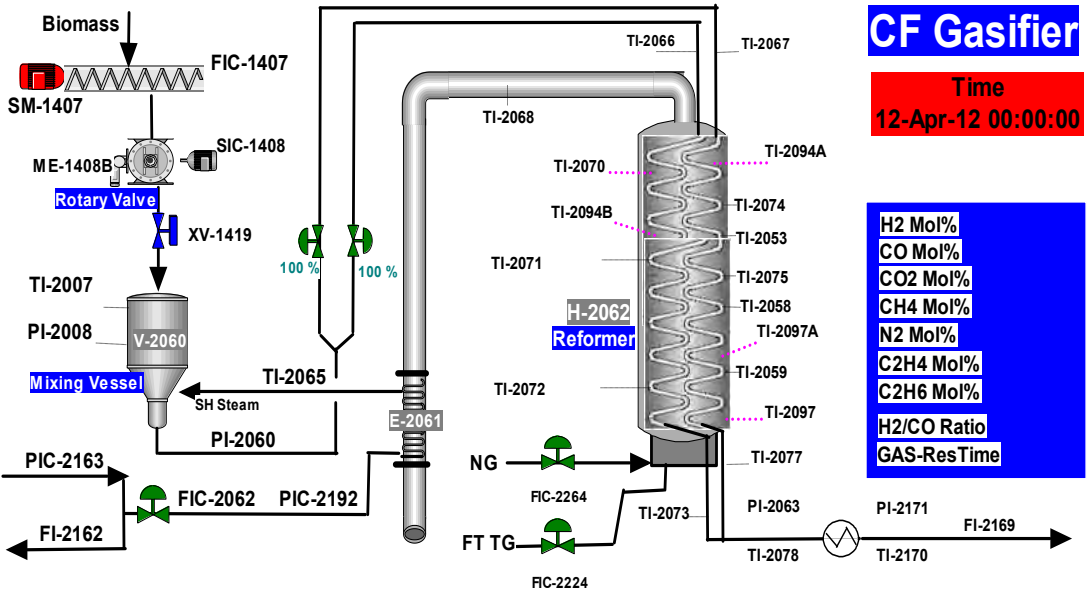
- Jointly submitted competitive proposal and received $23 million grant from DOE under the American Recover and Reinvestment Act, Rentech provided the remaining $13 million of funding for $36 million project

- Mechanically Complete of 20 ton-per-day biomass gasifier in Nov 2011 and current under startup and process optimization stage

- Rentech-ClearFuels gasifier will be demonstrated in 2012 during a series of 3 campaigns using sugar cane bagasse, virgin wood waste, & a combination of the two for the production of ASTM certified renewable jet and diesel fuels

ClearFuels IBR Performance



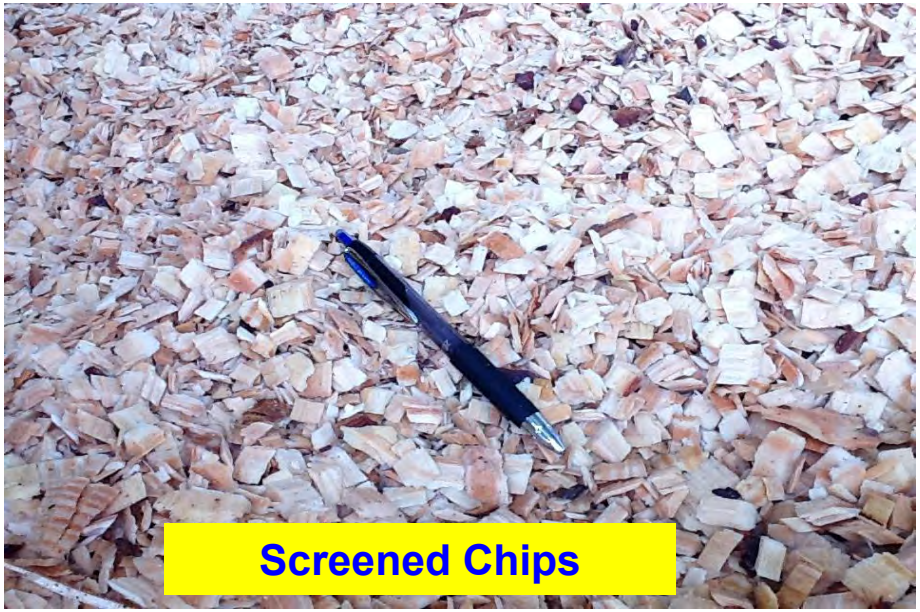


- Total ~ accumulative 100+ hrs stable operation in producing Biomass-Derived Syngas
- Steady Feed handling system & reformer operation
- Preliminary data indicates:
  - ✓ High Carbon Conversion to Gas
  - ✓ Consistent Low Tar Content (~15 PPMV) after water scrubber
  - ✓ Stable Syngas Composition

BECE

BTL Process Walk Through

Southern Pine White Chip Feedstock



* Courtesy of Steven Taylor from University of Auburn

ClearFuels Gasifier

Syngas Conditioning Unit

FT Reactor

UOP Product Upgrading

End Product: “Drop-In” Fuels