Genifuel HTP Overview

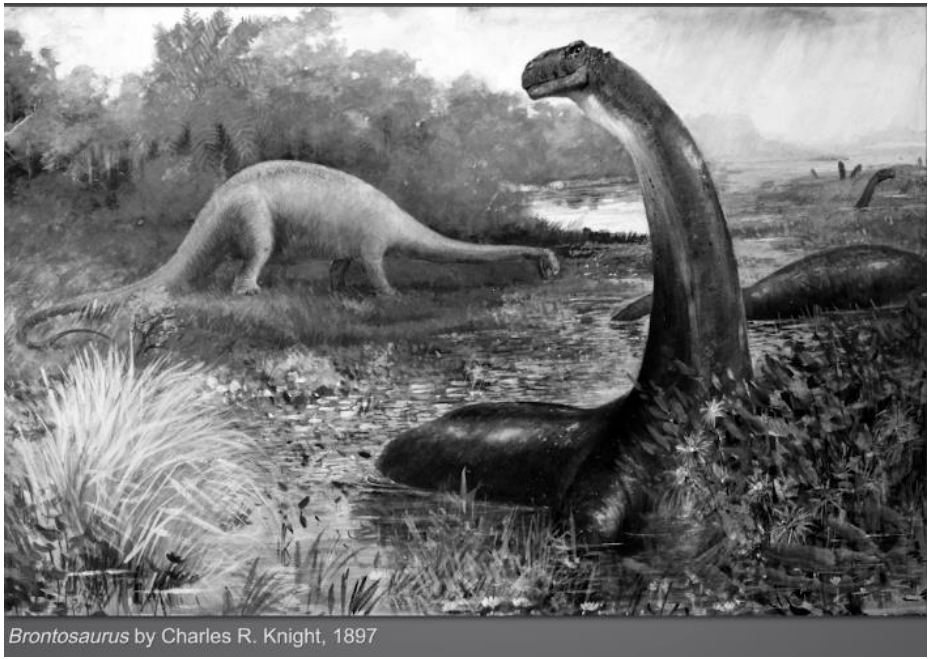
James Oyler, President
Genifuel Corporation

Background

Genifuel technology includes licenses from the US Department of Energy, which developed it for more than 40 years at Pacific Northwest National Laboratory

Technical Concept

- **The technology is called Hydrothermal Processing (HTP) and is similar to the formation of fossil fuels, but in 30 minutes rather than millions of years**
- **HTP uses temperature, pressure, and water to eliminate wet waste by converting it to oil and gas**


Brontosaurus by Charles R. Knight, 1897

Use With All Kinds of Wastes

Wastewater Solids

Drink and Food Processing

Animal Waste

Chemical Waste

Organic MSW

Primary focus is wastewater solids

Focus on Wastewater

- **Large market—over 16,000 wastewater utilities in US**
  - Additional market in Canada, Europe and other countries
- **Major regulatory changes are occurring in disposal of wastewater solids—transformation essential (e.g. PFAS)**
- **HTP is only process which completely addresses changes**
- **Utilities will pay tipping fee for disposal of solids—solids are 50% to 60% of operating cost and going up fast**
- **Multiple tiers of government incentives for green outputs**
- **Attractive economics, IRR 15-25%**
- **Positive climate for infrastructure investment**

Output Products

HTL Stage

Solids with Phosphorus

HTL Oil

Effluent Water

CHG Stage

Methane

Water

Offtake Pathways Identified

Biocrude is upgraded and refined, or blended directly with diesel fuel

Renewable Natural Gas goes into gas pipeline—no sulfur or siloxanes

Highly Efficient Process

>85% of feedstock carbon to oil and gas—
15% of produced fuel energy runs the process—C.I. = 23

Water is sterile, clear, and conserved; contains plant nutrients

Competitive Landscape

- **Incumbent technology is Anaerobic Digestion and most projects will face this competition**
  - Only disposes of half the waste
  - Sensitive to feedstock and messy to handle failures
  - Users are eager for an alternative
- **HTP completely eliminates waste and is cost-competitive**
  - Renewable fuels and elimination of solids handling produce superior returns for HTP
  - Transformative technology for transition from AD

Project 1: Processing Algae Since 2017

Project 2: Containerized System, 2019

Onsite tests with various wastes—e.g. dairy cow manure

Project 3: 2021 Startup

Wastewater Processing
Vancouver, Canada
2 dry metric tons per day

Metro Vancouver;
Refining Partner
is Parkland Fuel

Project 4: 2022 Startup

Central Contra Costa Sanitary District, Martinez, CA
2 dry metric tons per day

Refining Partner
is Kern Oil & Refining
Bakersfield, CA

Market Profile (HTP Systems)

Flow (MGD)	Pop. Served	No. of Sites	Dry t/d	Avg. Cost $M	Total $M
<0.5	<1,000	1,000	<0.1	<$1.0	$3,000
0.5	1,000	6,363	0.1	$1.0	$6,363
3.0	8,000	5,520	1.0	$4.3	$23,736
30	100,000	2,686	10	$22	$57,749
300	800,000	414	100	$110	$44,505
8000	2,300,000	31	250	$250	$6,327
	TOTAL	16,014		**TOTAL $**	$141,680*

***Redundancy, site work, and O&M increase total market to more than $300 Billion**

The Genifuel Team

Genifuel

Thank You!