



**AEMETIS**

**The Aemetis Biorefinery  
(NASDAQ: AMTX)**

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**October 2017**



# Disclaimer

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Certain of the statements contained herein may be statements of future expectations and other forward-looking statements that are based on management's current views and assumptions and involve known and unknown risks and uncertainties that could cause actual results, performance or events to differ materially from those expressed or implied in such statements. In addition to statements which are forward-looking by reason of context, the words "may, will, should, expects, plans, intends, anticipates, believes, estimates, predicts, potential, or continue" and similar expressions identify forward-looking statements.

Actual results, performance or events may differ materially from those projected in such statements due to, without limitation: (i) general economic conditions, (ii) ethanol and gasoline prices, (iii) commodity prices, (iv) distillers grain markets, (v) supply and demand factors, (vi) transportation rates for rail/trucks, (vii) interest rate levels, (viii) ethanol imports, (ix) changing levels of competition, (x) changes in laws and regulations, including govt. support/incentives for biofuels, (xi) changes in process technologies, (xii) the impact of acquisitions, including related integration issues, (xiii) reorganization measures and (xiv) general competitive factors on a local, regional, national and/or global basis, (xv) natural gas prices, and (xvi) chemicals and enzyme prices.

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## **Non-GAAP Financial Information**

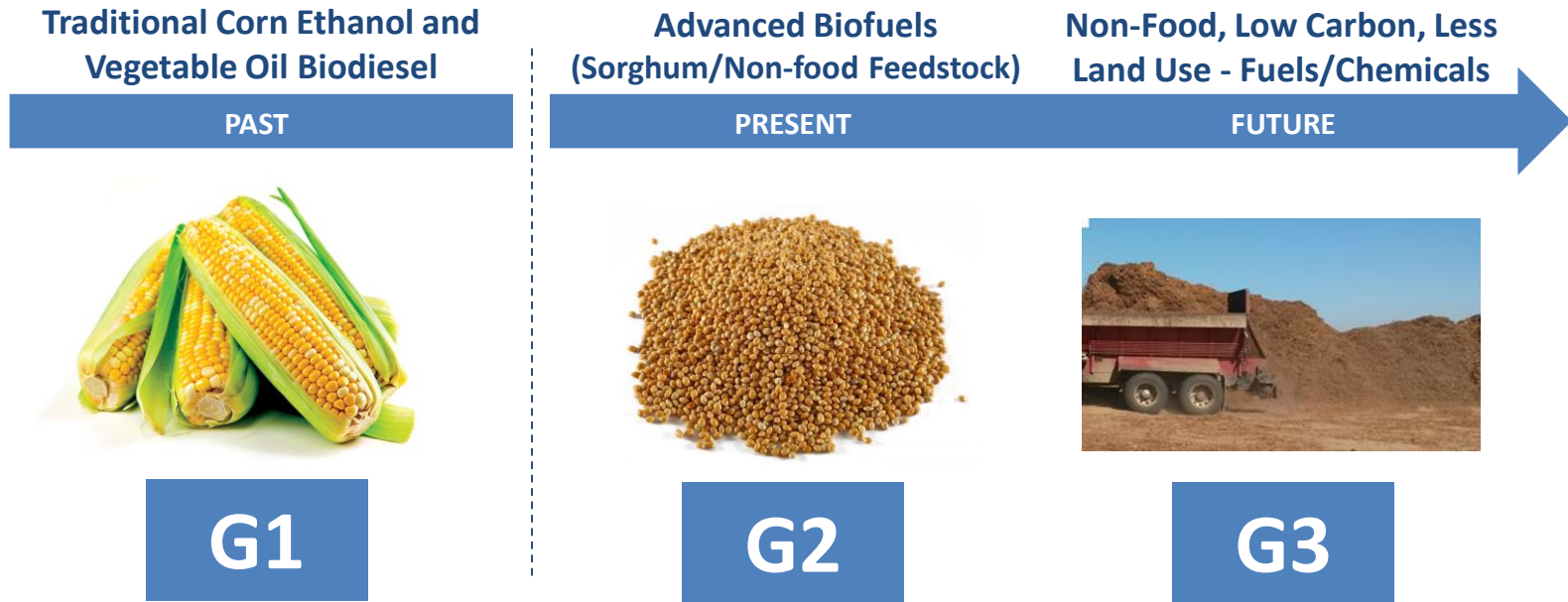
We have provided non-GAAP measures as a supplement to financial results based on GAAP. A reconciliation of the non-GAAP measures to the most directly comparable GAAP measures is included in the accompanying supplemental data. Adjusted EBITDA is defined as net income/(loss) plus (to the extent deducted in calculating such net income) interest expense, loss on extinguishment, income tax expense, intangible and other amortization expense, depreciation expense, and share-based compensation expense.

Adjusted EBITDA is not calculated in accordance with GAAP and should not be considered as an alternative to net income/(loss), operating income or any other performance measures derived in accordance with GAAP or to cash flows from operating, investing or financing activities as an indicator of cash flows or as a measure of liquidity. Adjusted EBITDA is presented solely as a supplemental disclosure because management believes that it is a useful performance measure that is widely used within the industry in which we operate. In addition, management uses Adjusted EBITDA for reviewing financial results and for budgeting and planning purposes. EBITDA measures are not calculated in the same manner by all companies and, accordingly, may not be an appropriate measure for comparison.



# Aemetis Mission

Aemetis is an international renewable fuels and biochemicals company using patented industrial biotechnology for the conversion of first-generation ethanol and biodiesel plants into advanced biorefineries



# Aemetis Overview

- **Founded in 2006 by biofuels industry veteran (co-founder Pacific Ethanol and EPM)**
- **\$147 million revenue for 2015**
- **Own/operate 60 million gallon Ethanol plant in California**
  - Largest biofuels refinery in California
- **Own/operate 50 million gallon Distilled Biodiesel and Glycerin refinery in India**
- **Exclusive license to 10 granted patents on technology to produce advanced fuels**
- **Significant India revenue growth without large additional capital expenditures**
- **Licensed technologies for Cellulosic Ethanol and Renewable Jet/Diesel**



# Management and Board of Directors

## Board of Directors

- Harold Sorgenti** - Former President/CEO of ARCO Chemical Company (12 years including IPO)
- John Block** - Former Secretary of Agriculture from 1981-86 under President Reagan
- Fran Barton** - Former CFO of five high tech companies with revenues above \$1 billion
- Dr. Steven Hutcheson** - Molecular genetics founder of Zymetis, acquired in 2011 by Aemetis



### **Eric McAfee - Chairman and CEO**

- Founder of *Aemetis* (NASDAQ: AMTX) and co-founder of *Pacific Ethanol* (NASDAQ: PEIX)
- Founding shareholder of oil production company *Evolution Petroleum* (NYSE: EPM)
- Founded seven public companies and funded twenty-five private companies as principal investor



### **Todd Waltz - EVP and CFO**

- Joined Aemetis in 2007
- Served in senior financial management roles with Apple, Inc. for 12 years
- Ernst & Young CPA



### **Andy Foster - EVP and President, Aemetis Advanced Fuels**

- Joined Aemetis in 2006
- Senior executive at three Silicon Valley tech companies
- Served in the George H.W. Bush White House (1989-1992) as Associate Director - Office of Political Affairs and as Deputy Chief of Staff for Illinois Governor Edgar for five years



### **Sanjeev Gupta - EVP and President, Aemetis International**

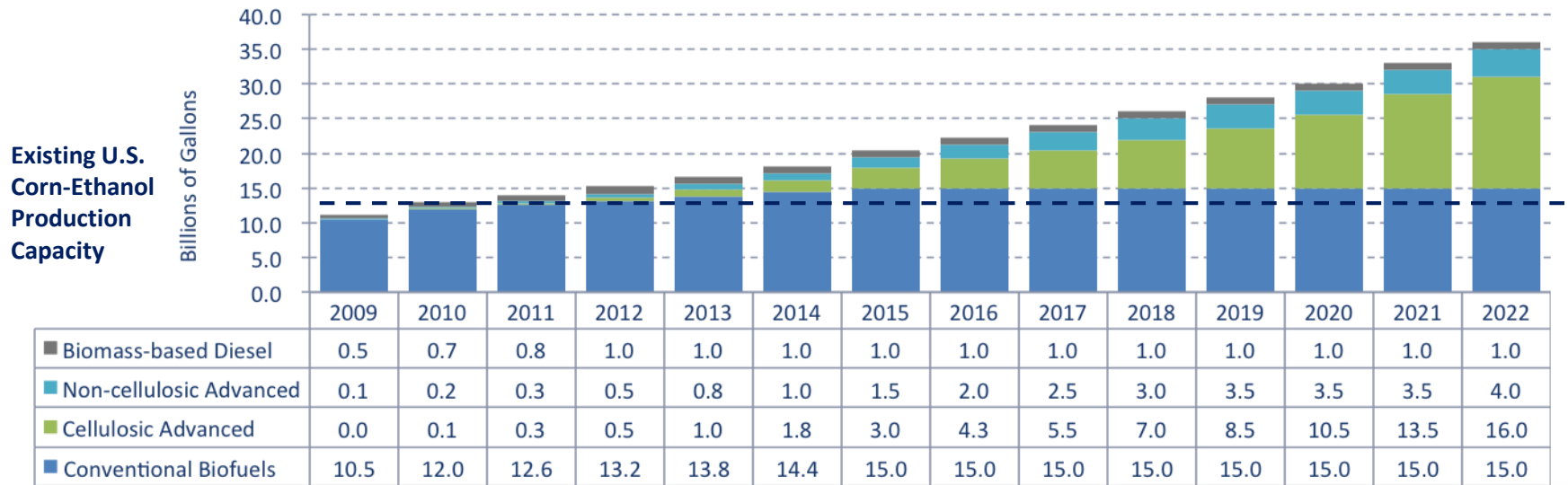
- Joined Aemetis in 2007
- Previously head of petrochemical trading company with about \$250 million of annual revenue and offices on several continents



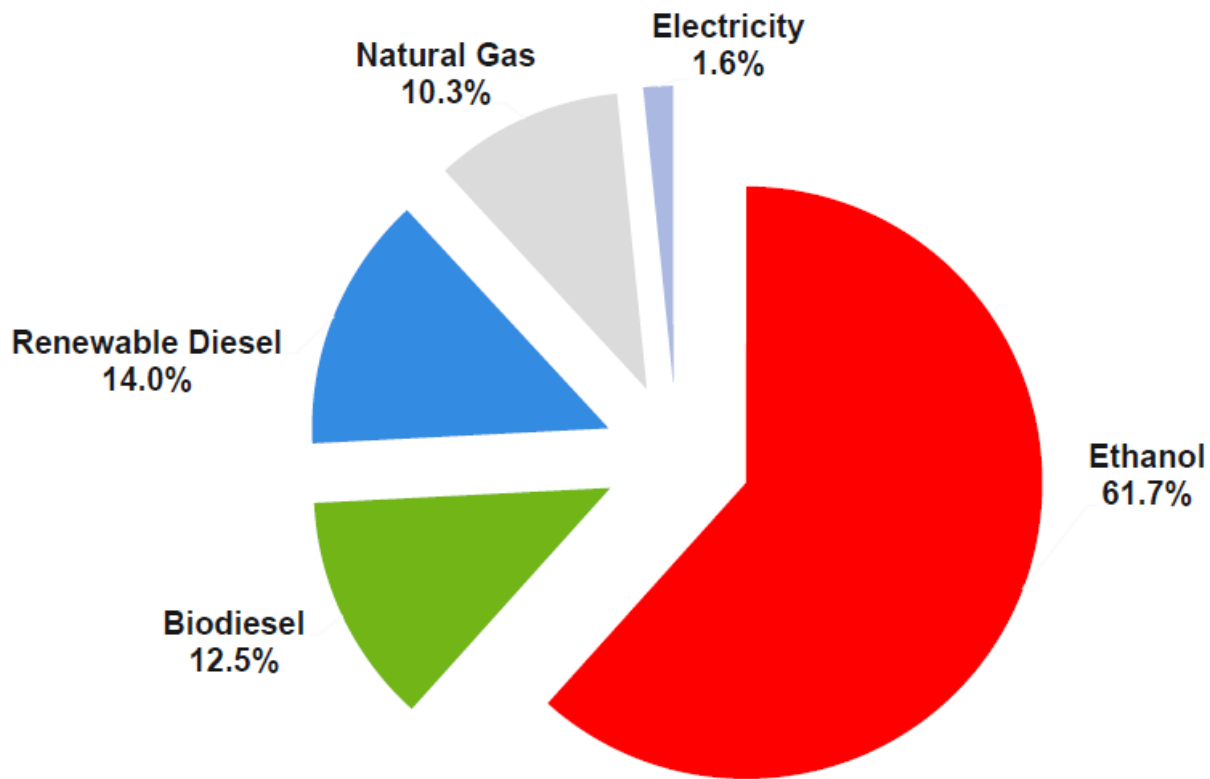
# The Increasing Renewable Fuel Standard Mandate

*In order to meet the federal Renewable Fuel Standard, obligated parties are required to blend ethanol and biodiesel in increasing quantities each year*

- “Conventional Biofuels” must reduce greenhouse gas emissions by 20% relative to gasoline or diesel and “Advanced Biofuels” must reduce greenhouse gas emissions by 50%
- 14.5 billion gallons per year (BGY) of ethanol mandated in 2016, with current capacity of 15 BGY
- 24 month termination of excess RIN’s, higher ethanol blends (E15 and E85) and export markets to drive supply/demand into balance in 2H 2016 and beyond



# Low Carbon Fuel Standard Credits: Biofuels 80%+



Sources of credits through Q1 2014

**Source:** California Air Resource Board. "Low Carbon Fuel Standard Re-Adoption: Fuel Availability." Sep, 25<sup>th</sup> 2014.



# Ethanol Molecule: High Octane and High Oxygen

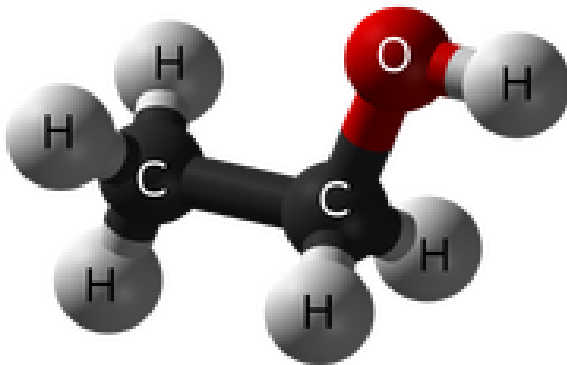
## *Unique Properties of Ethanol Molecule*

- Ethanol is 113 octane = prevents pre-ignition of fuel and lost power under high compression
  - Indy race cars are 100% alcohol (no gasoline) to maximize engine compression
  - Gasoline refiners produced 87 octane gasoline in 1970's before ethanol adoption in US
  - Now refiners produce only 84 octane gasoline and blend E10 for 87/89/91 octane
- 34% oxygen in ethanol = cleaner burning gasoline

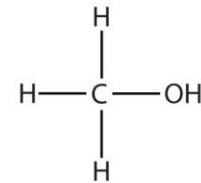
Mass of oxygen in ethanol = 16g

Mass of ethanol = (2\*12g) Carbon + (6\*1g) Hydrogen + (1\*16g) Oxygen = 46g

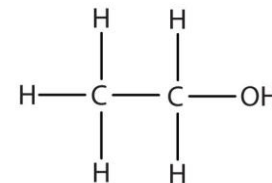
Percentage of Oxygen in ethanol = 16g / 46g = 34.78%



methanol



ethanol

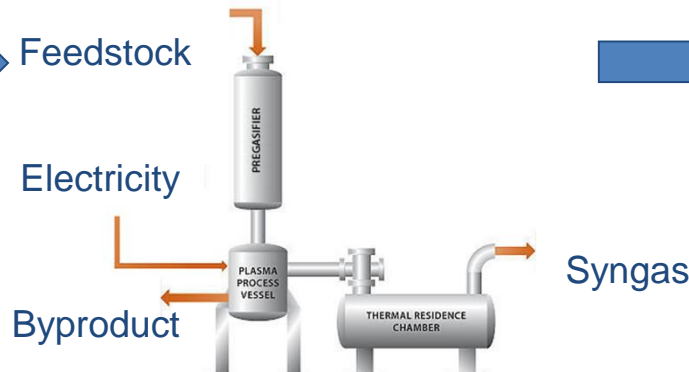


# LanzaTech Technology: Biomass to Syngas to Cellulosic Ethanol

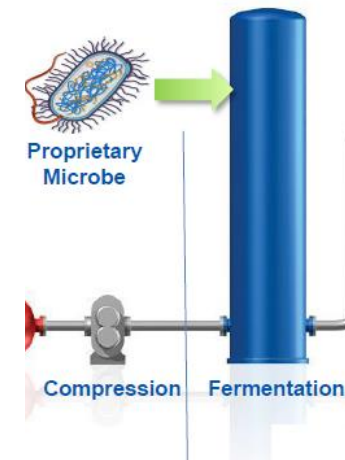
## Feedstock



## Gasification



## LanzaTech Fermentation



### Biomass

- Orchard/Vineyard Wood Waste
- Orchard Byproducts
- Forest Waste

## Ethanol Plant Integration



*Aemetis implementing first biomass-to-ethanol plant using LanzaTech process*



# Scale-Up Success



- Scale-up Factor Less Than What is Proven at Demo Scale.
- Building of commercial scale is underway in Europe and soon to be underway in Asia.



# LanzaTech Pre-commercial steel mill demonstrations

- Performance milestones exceeded
- First commercial is designed and long lead time items are ordered for deployment in Europe



Exceeded design capacity.

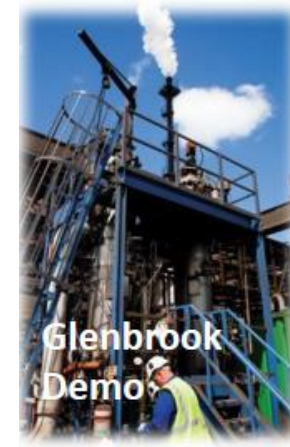


WBT (CSC/LCY) Demo

- ***Mitigating Scale up Risk through Successful Technology Demonstration***



Bao Demo



Glenbrook Demo



# LanzaTech Facilities

40,000 combined hours on stream  
Multiple runs exceeding 2,000 hours



*Multiple plants at various scales all demonstrating different key aspects of process*



# Existing Facilities

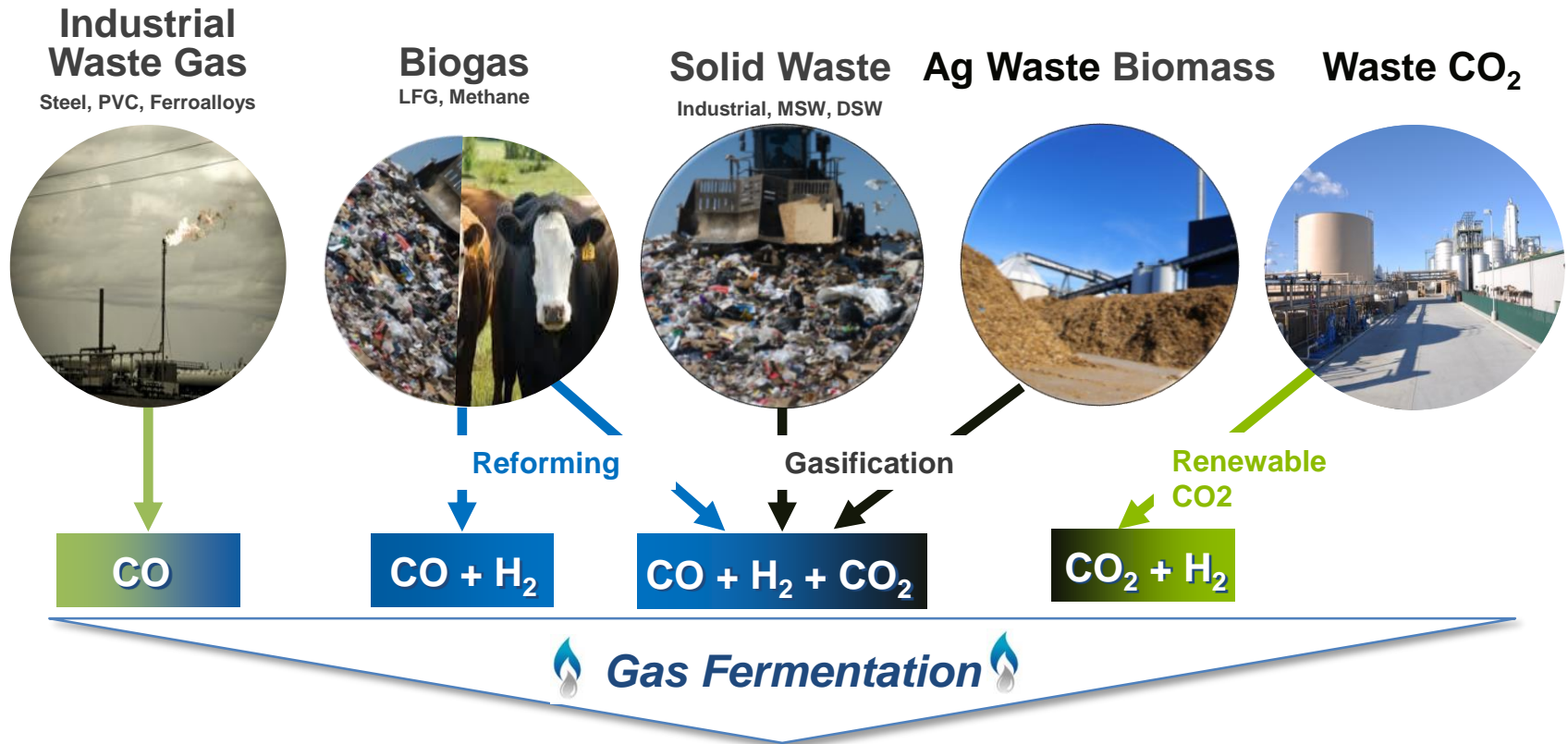


## Aemetis Advanced Fuels Keys

- Shougang Demo Plant 2012
- WBT Demo Plant 2014



# Waste Feedstock Diversity



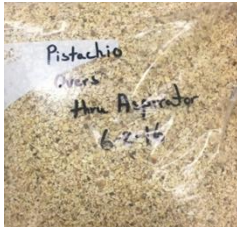
By utilizing wastes from forest, dairy, orchard, vineyard, corn, rice, wheat and CDW sources local to the Aemetis, we plan to decrease costs from more than \$150 per ton to receiving tipping fees from waste feedstocks



# LanzaTech Proof of Concept Complete



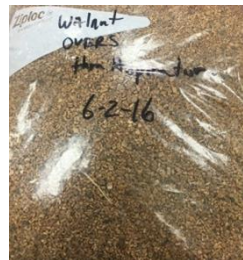
Walnut Wood



Pistachio Shell



Almond Wood



Walnut Shell



## Gasification



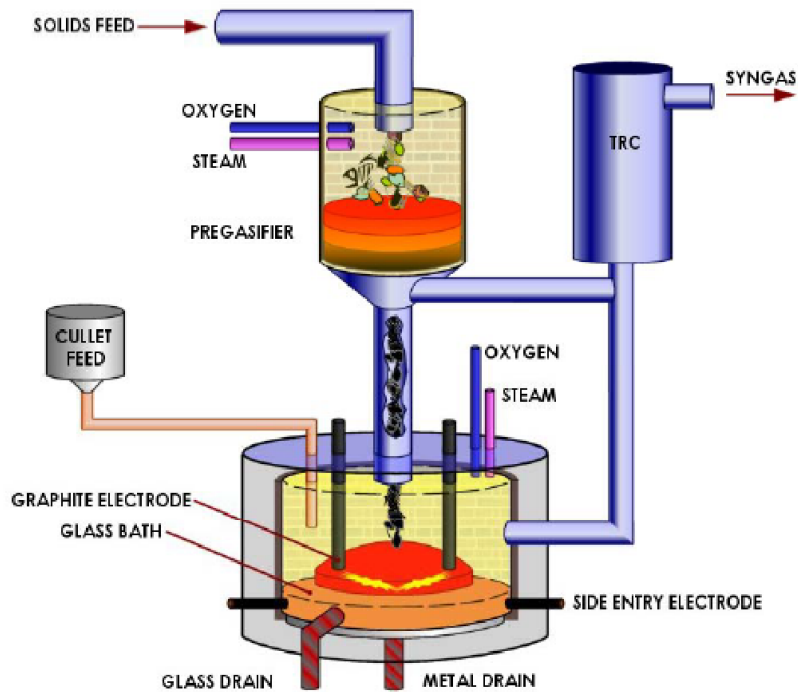
## Fermentation



# Gasifier Overview

Downdraft Gasifier + PEM

25 TPD Unit



# Product Information & Comparison

## Competitive Product

Similar protein products have been able to sell for over \$1,200/MT, and our product is very competitive from a nutritional standpoint:

	Shougang Protein	Similar Protein Additive	Fishmeal
% Protein	72	71	60-72
% Fat	0	10	6-10
% Ash	2.6	7	10-15

## High Demand

We will be selling the protein to U.S. fish feed producers, who sell feed to aquacultures throughout the U.S. A high nutrient density is extremely attractive to these aquacultures for several reasons:

- **Low Feed Conversion Ratio (FCR)** — Less feed is required to produce fish meat. A ratio of 1.2:1 is considered very good; proteins similar to ours have fetched ratios as low as 0.7-0.8:1.
- **Cleaner Water** — Because less feed is required to meet the nutrient requirements, there is less feces and less food waste to deal with.
- **Stronger Fish Growth** — Particularly for salmonids and juvenile fish, growth is mostly addition of lean protein tissue, so a higher percentage of protein is required in the diet to supply the essential amino acids.



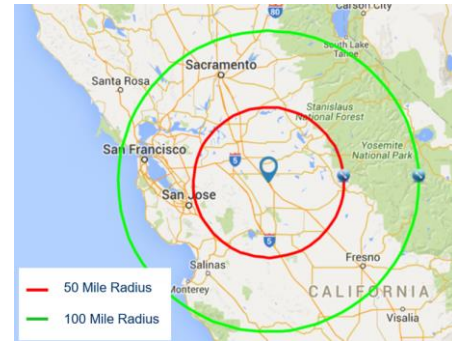
# Local Feedstock Availability

## About 1 million acres of Almonds in California

- 20-25 year almond tree life = about 40,000 acres per year removed
- About 50 tons per acre of orchard removal waste = 2+ million tons/year

## Biomass-to-Energy Plants Closing in California

- Lack of ability to compete with low-cost solar, wind and natural gas
- Spreading orchard wood waste on farmland can damage crops
- Biomass is being burned to avoid future crop damage



## *California plants can produce 120+ million cellulosic ethanol gallons per year*

- 4 ethanol plants each could produce about 32 million cellulosic gallons per year
- At 80 gallons per ton of waste feedstock, requires 1.6 million tons of biomass
  - Almond/pistachio/walnut wood waste
  - Dairy waste: more than 2 million tons per year available



# Available Feedstock Diversity

## Feedstock Use:

- Almond Waste
- C&D Lumber(MSW)
- Manure
- Peach Waste
- Prunings and Trimmings
- Walnut Waste
- Vineyard Waste
- Paper and Cardboard
- Forest Waste
- Food Waste
- MSW
- Medical Waste
- Hazardous Waste
- Rice Hulls





# AEMETIS

[www.aemetis.com](http://www.aemetis.com)

