



**SYNTECH  
BIOENERGY LLC**  
Resourceful. Renewable. Responsible.

*The future of  
Distributed Clean Energy*



# SynTech SOLUTIONS

Advanced thermochemical conversion and end-of-waste solutions  
delivering the next generation of distributed clean energy

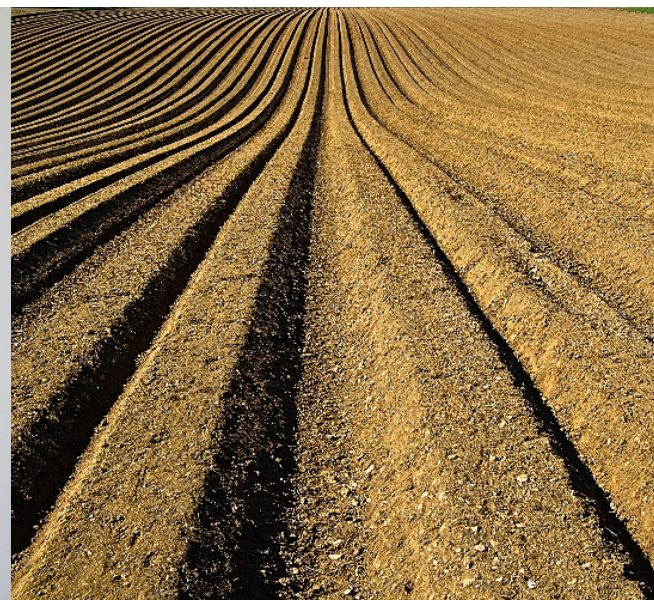
**Power**



**Heat**



**Fertilizer**



**Fuel**



# SynTech EVOLUTION



Acquired August 2015



Acquired March 2016

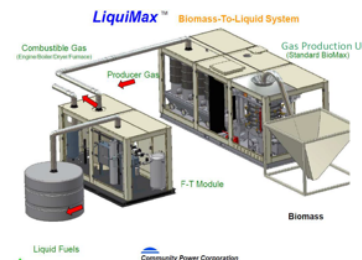


>\$135 million USD  
IP developed since

BioMax®

1999

LiquiMax®  
2009



FluiMax®

2003





# SynTech TECHNOLOGIES

	BioMax®	FluiMax®	LiquiMax®
Technology	Downdraft gasifier	Fluidized bed gasifier	Proprietary micro-refinery GTL platform
Primary feedstocks	Biomass including wood chips, pellets; walnut, pecan & other nut shells; olive and fruit pits; other	BioMax® feedstocks; refuse derived fuels (RDF); municipal solid waste; rice & wheat straw; poultry litter, cattle, swine, & waste-water bio-solids; other	Syngas from BioMax® & FluiMax®; landfill flare gases; wellhead flare gasses; natural gas; industrial & other waste gases
Output	165 kW- 1 MW+	1 MW- 100 MW	25 bbls-5000 bbls/day



# Technology Patents & Trade Secrets

**Multiple families of IP protected globally**



Families: BioMax®, FluiMax®, LiquiMax®

- Granted: 17 patents
- Published: 4 patents
- Pending: 5 patents
- Expiration: 2026 & 2029
- Trade Secrets: 15

See Appendix for details

# BioMax® Evolution

Alpha



1999  
Proof of Concept  
Littleton, Co

2.5KWh gross

Beta



2001  
BioMax® Village Power  
Philippines

15 KWh Gross

1<sup>st</sup> Unit at Commercial Site



2008  
BioMax® 50 - Dixon Ridge Farms  
Winters, California  
20,000 hours operation

50kwh Gross

Military Application



2011  
ACE BioMax® 100 – Ft. Carson, CO  
R&D Project

130kwh Gross



# BioMax® Evolution- 45 Pre-Commerical Deployments

Gen 1



2012

BioMax® 100

Manitoba, Canada

Gen 1 and Gen 2 array



Gen1 - 110kWe

Gen 2 - 145kWe

Dec 2012

Jan 2015

BioMax® 100

BioMax® 100

runs 24x7

runs 24x7

Dixon Ridge Farms, Winters, California

3 Gen 1 Array



Jan 2015

(3) BioMax® 100

Premiere Mushroom Farm

Colusa, California

Max at peak 300+kWe

# BioMax® FEEDSTOCK FLEXIBILITY

## Ready to use

Many biomass feedstocks require no pre-processing beyond simple drying and sorting, including:

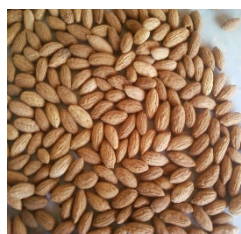
**Nut Shells**



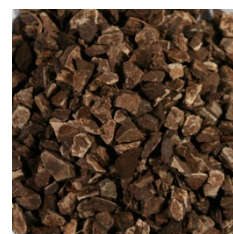
**Wood Chips**



**Olive Pits**



**Coconut Shells**



**Jojoba Pulp**



**Wood Pellets**



**Jatropha**



**Date Seed**



## Processed Biomass

Additional biomass feedstock is abundantly available with sorting, drying and densification, including:

**Cotton Trash**



**Pine Barks**



**Utility Trimmings**



**Sugar Cane**



**Bamboo**



**Corn Cob/Stover**



**Grape Vine**



**Fruit Pits**



## Future Feedstocks

Global demand for small scale remediation of site-produced, problematic waste streams provide growing markets for new products, including:

### Institutional Solid Waste from

- Hospitals & Medical Centers
- College & University Campuses
- Resorts & Hospitality Centers
- Defense Installations
- Correction Facilities
- Sport Stadiums

### Commercial Waste from

- Large Scale Food Processors
- Big Box Retailer & Grocers
- Construction & Demo Debris
- Industrial Producers

### Long Range Wastes from

- Medical Wastes
- Dental Wastes
- Biologic Wastes
- Biohazard Wastes



# FluiMax® FLUIDIZED BED REACTOR

## Skid Mounted 1-5MWe Systems



Scalable from 1MWe to >25 MWe

**1-5 MWe CHP**  
*Skid Mounted  
Factory Assembled  
750kWe-5Mwe Output  
Powers 1000+ Homes*

**Scalable**  
*To 10 MWe Skid Mounted  
To 25 MWe+ design/build  
Feedstock Flexibility  
Powers 2500+ Homes*

## Site-built 10-25MWe+Systems



## FluiMax® FEEDSTOCK FLEXIBILITY

Remediates problematic wastes with high silica, alkali, potassium and other harmful content including:

MSW



Poultry Litter



Refuse Derived Fuel



Wheat Straw



Animal Bio-Solids



Waste Water Sludge



Digester Sludge



Medical/Biowaste





# LiquiMax® SMALL SCALE MICRO-REFINERY

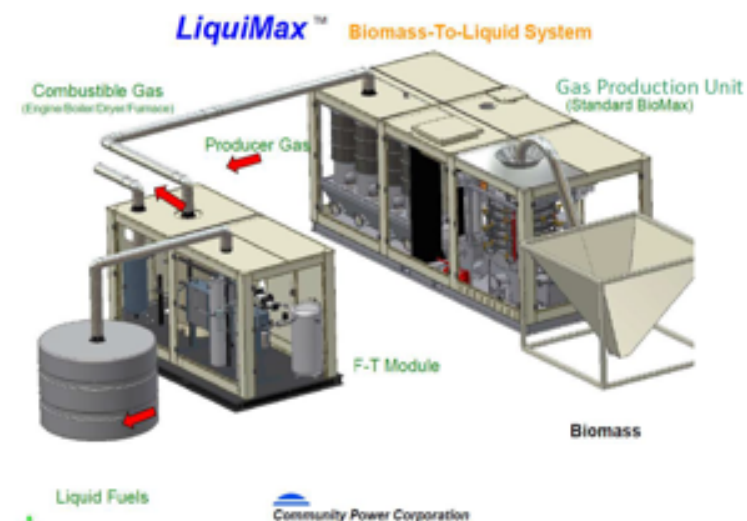
Advanced, drop-in liquid fuels from waste

## Feedstocks:

- Landfill flare gas
- Wellhead flare gas
- Digester gas
- Natural gas
- Raw MSW
- Biomass
- RDF

## Fuel Types & Benefits:

- Renewable, clean burning diesel and jet fuels
- Require neither blending nor engine modification
- Other output include
  - High value wax (for synthetic motor oils)
  - Pipeline transportable synthetic crude
  - Methanol/Ethanol
- Carbon capital opportunities from displacing fossil fuels and waste
- Operates a small scale: 25-5000 barrels per day
- Skid mounted and scalable



# SynTech REVENUE

Products & Services
Technology sales
Technology licensing
Turnkey project delivery
Lean manufacturing
Consulting & engineering
EPC services
Operations & maintenance
Parts & services

## PROJECT REVENUE STREAMS



Electricity - \$0.072/kWh to \$0.327/kWh



Heat - \$2.50-\$8.50 per million BTU



Fertilizer (Biochar) - \$500-\$2,000+ per ton



Waste disposal gate tipping fees - \$8-\$150 per ton  
(US avg. \$49 per ton)



Investment & Production Tax Credits - \$0.023 per kWh  
production credit or 10-30% investment credit



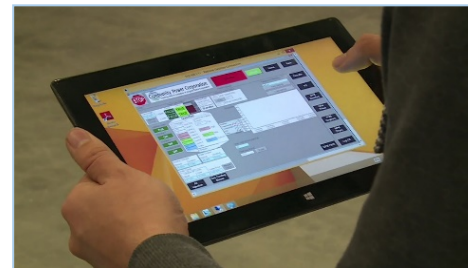
Carbon credits \$7-\$37+ per MWh



# COMPETITIVE ADVANTAGE

**SynTech disrupts & displaces inefficient & costly incinerators, digesters, pyrolysis & other traditional methods**

- Continuous and uninterrupted distributed base load power
- Modular, scalable and transportable
- Small footprint, carbon-negative operation
- Diverse feedstocks, fully automated, remotely operable
- Global smart and micro-grid applications
- Syngas & biochar fertilizer outputs only



**Immediately available, commercially proven & deployed technologies**

# MULTIPLE IMPACT BOTTOM LINE

- Energy
- Environment
- Economy & Employment
- Food & Water
- Health
- Housing
- Empowerment

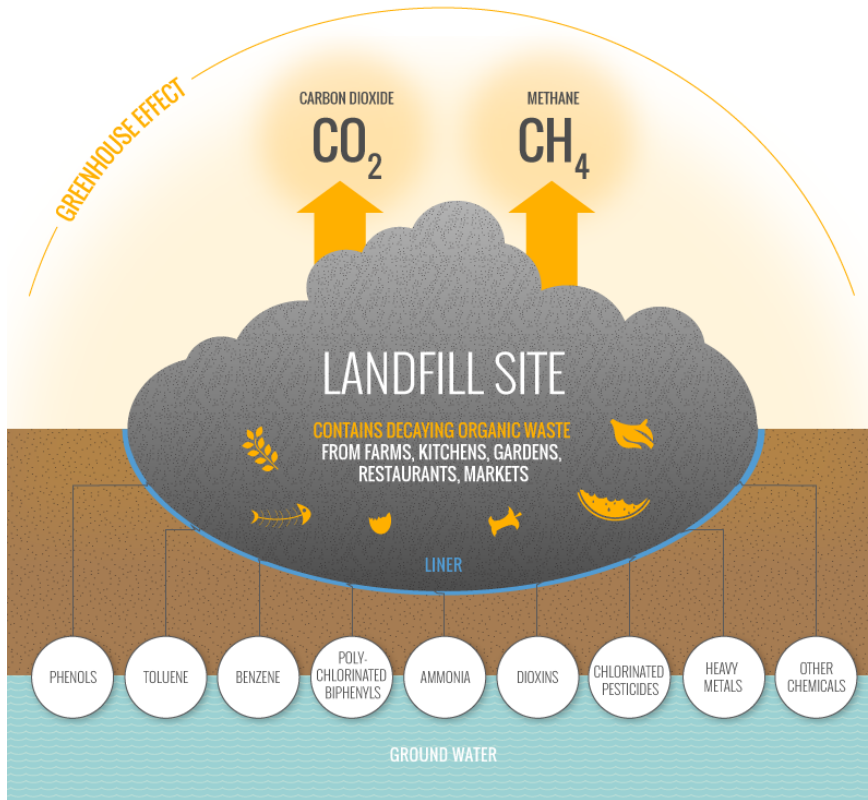




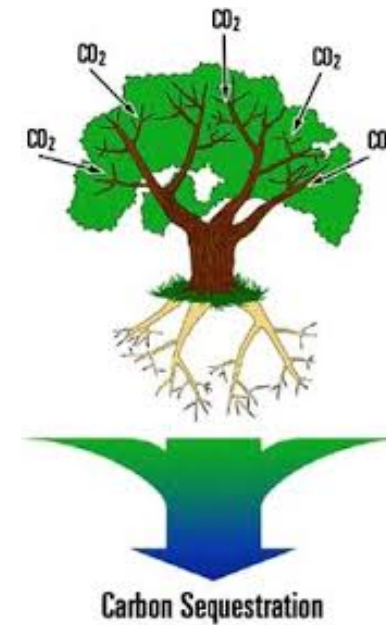
# CARBON LIFE CYCLE REDUCTIONS



Transport of waste avoidance



Landfill avoidance



Biochar sequestration



No water in, no water out



Displacing fossil fuel power and heat

## Global Distribution Points of Entry

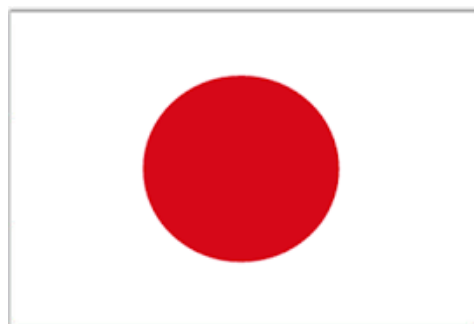
US



UK



Japan



Israel

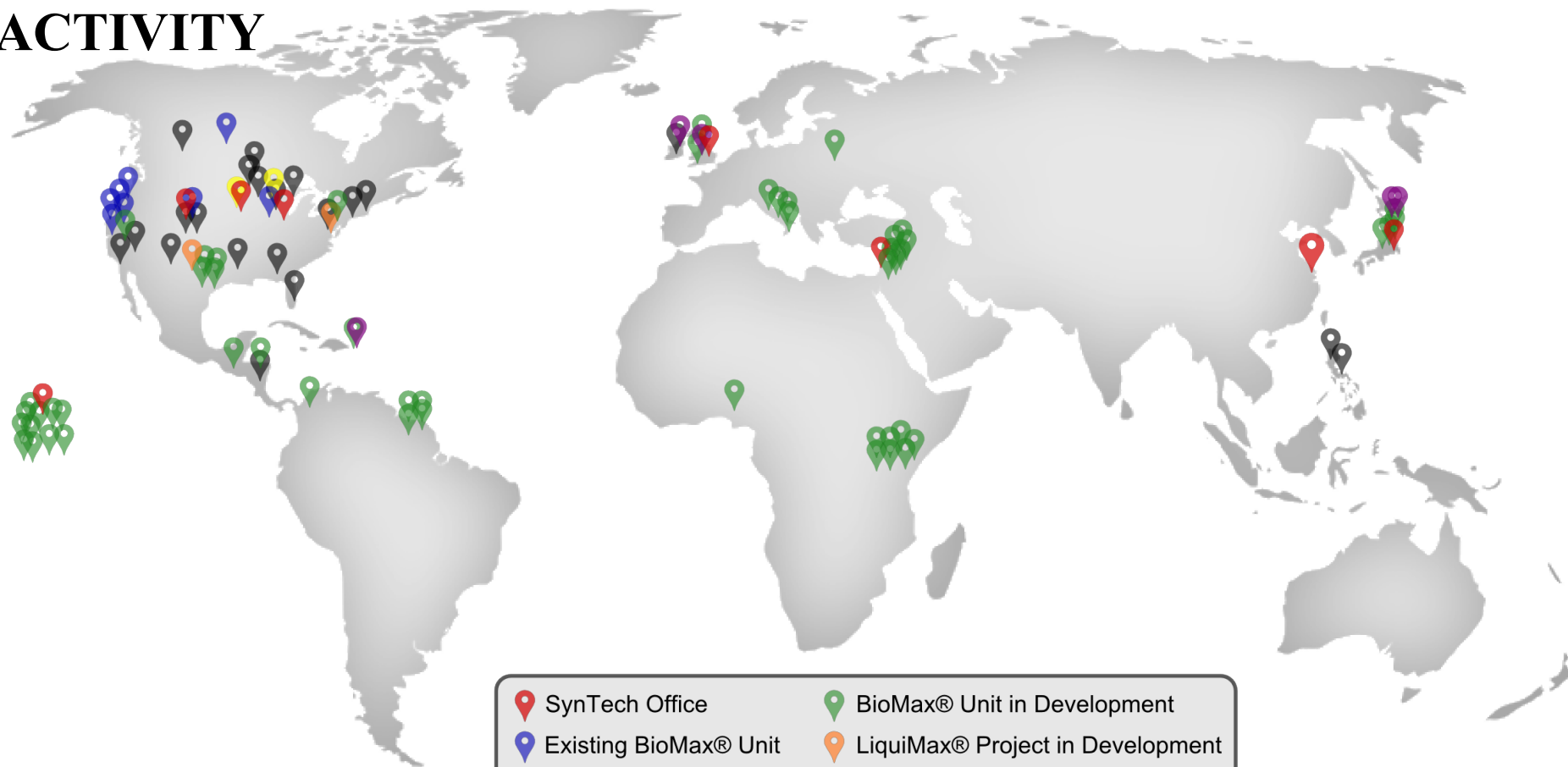


French Guiana





# GLOBAL ACTIVITY



- SynTech Office
- BioMax® Unit in Development
- Existing BioMax® Unit
- LiquiMax® Project in Development
- Existing FluiMax® Project
- FluiMax® Project in Development
- Pre-commercial BioMax® Unit



## *The Future of Distributed Clean Energy*

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