



strategic business development

For LAEDC - Green Task Force

"Biogas Production Technology"

October 26, 2009

The California Club – Los Angeles, CA

SeaHold

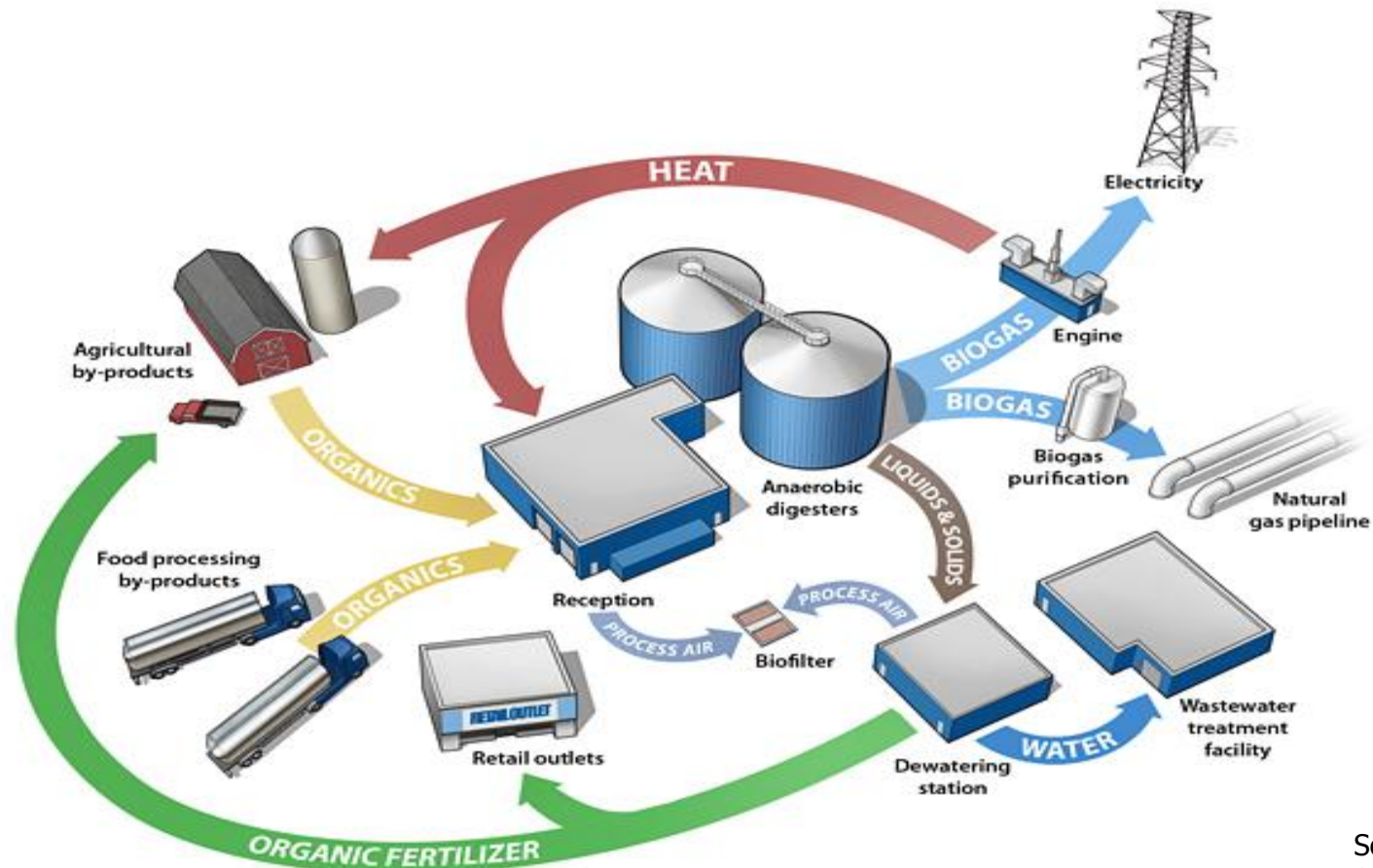
- Thomas M. Hintz, Member Partner
- 20 years Business Development Experience
 - Inaugurated cow gas in CA,
 - delivery to natural gas grid!
 - Permitting renewable energy park and projects
Contracting with energy, utility companies and technology firms
 - Moving regulatory agendas forward
 - Proven value creation history
 - Starting up to ongoing operations

Basic Biogas Production

- ***“If it rots, it’s good for gas!”***
- *Digestion = Gas*
- *Anaerobic digestion basics*
 - *Anaerobic digestion is a series of natural processes that breaks down organic materials in the absence of oxygen, allowing for the reduction of greenhouse gas emissions and the capture of valuable “biogas” (CH₄ & CO₂) and other environment enriching products.*



Basic Biogas Production



Source:
Stormfisher
Biogas

Feedstock's For Biogas

- Manures: dairy, poultry, swine
 - *Factoid: CA has over 2000 dairies and 1.8 million cows producing 150 pounds of manure per day!*
 - *LA County has 2 operating dairies; neighboring Riverside & San Bernardino Counties have 88 operating dairies*
- Food/Yard Waste: from food processing firms, supermarkets, caterers – extract energy prior to composting and avoid the landfill!
- Biomass/energy crops: cultivating specific crops for energy production

Benefits Of Digesters

- Collected biogas can be used for
 - Fuel for electrical generation
 - Facility energy needs
 - Injected into the natural gas pipeline
- Liquid & Solid remainder of digester process can be used to fertilize crops
- Utilizing digesters provides the generation of valuable CARBON OFFSET CREDITS for individuals and businesses

Types Of Digesters

- Covered Lagoon
 - *Large, in-ground covered "lagoons", designed to handle mostly manure based feedstock*



Joseph Gallo Farms
Cottonwood, CA

Types Of Digesters

- Complete Mix
 - *In-ground or above ground round or rectangular tanks use both manure and other feedstock's*



Fiscalini Farms
Modesto, CA

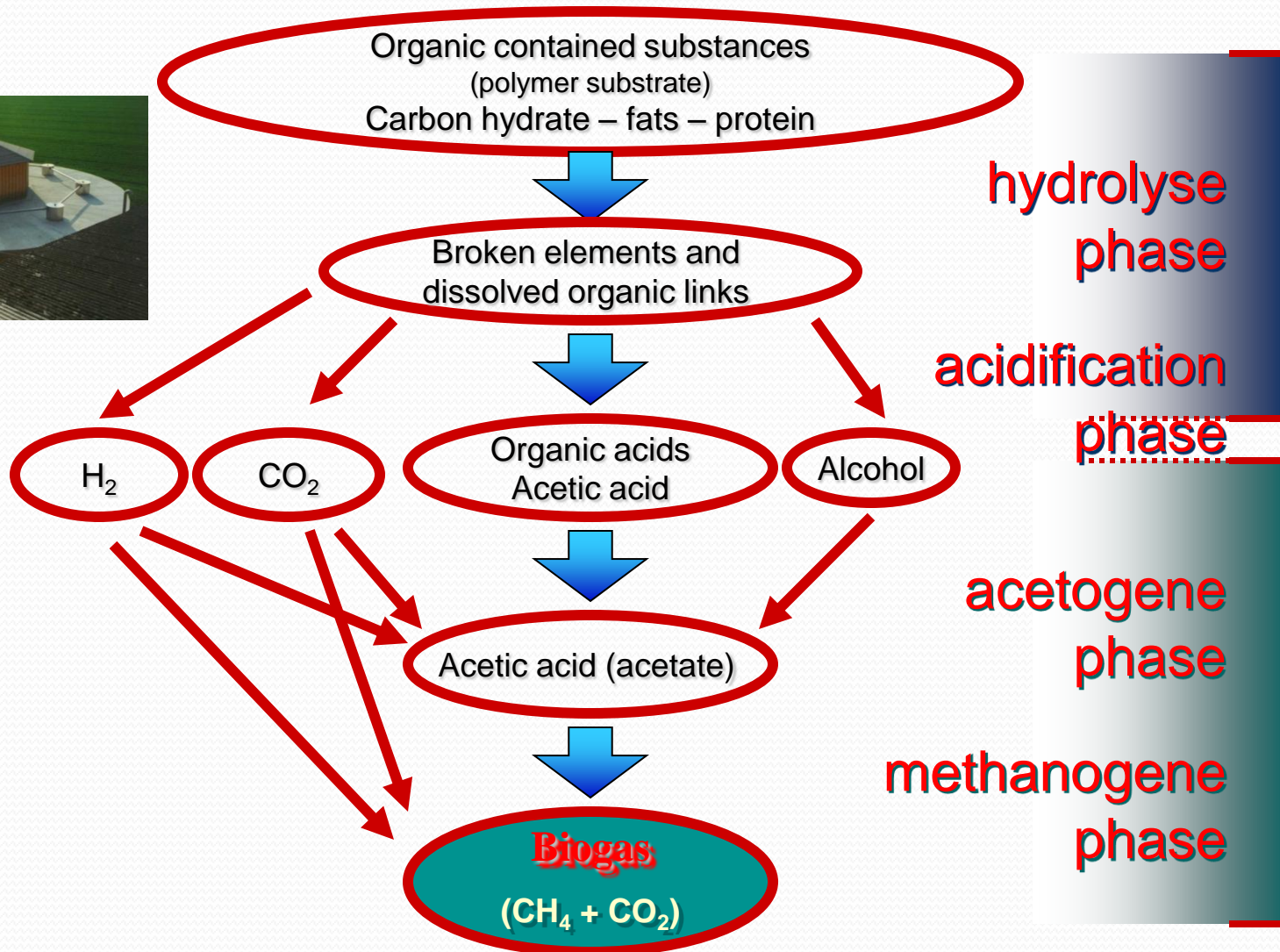
Types Of Digesters

- Plug Flow
 - *In-ground rectangular tanks, use manure based feedstock, which is heated to enhance production of biogas*



Typical plug-flow digester from EPA.GOV

Anaerobic Function



1st Stage
compulsory anaerobic and
facultative aerobic

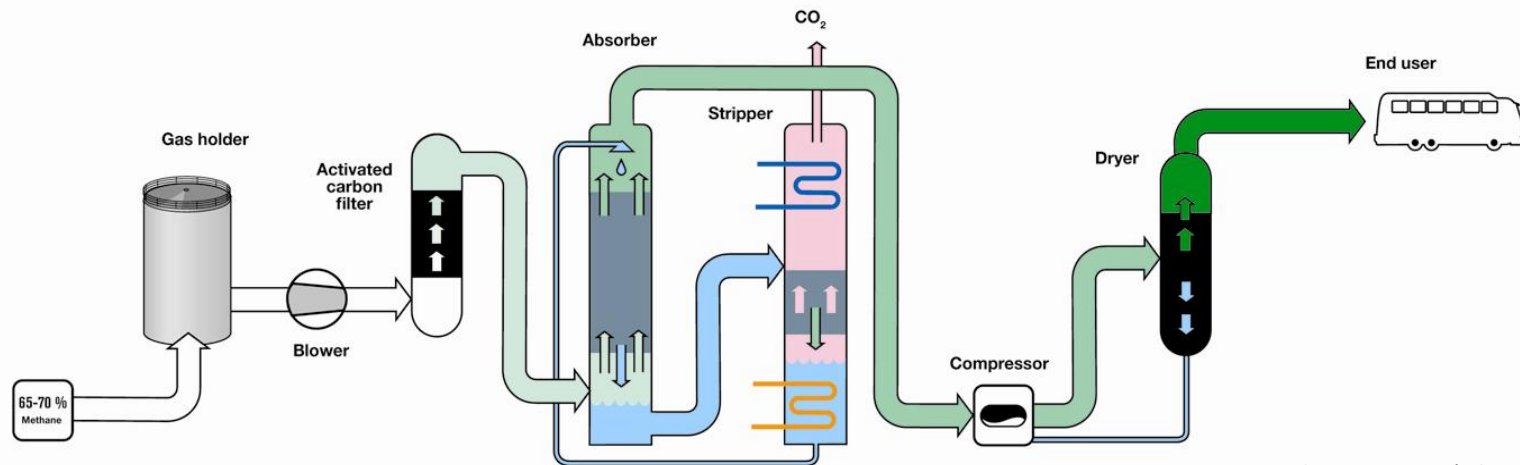
2st Stage
compulsory anaerobic

Gases Produced

- CH₄ – Methane – greenhouse gas causes Global Warming and climate change to increase 20 times faster than “Carbon Dioxide” emissions!
- CO₂ – Carbon Dioxide – naturally produced greenhouse gas responsible for trapping heat.

Biogas Upgrade Process

- Raw biogas must first be “upgraded” for use in eventual energy generation
- Typical process takes the biogas, filters it in several stages, removing the CO₂, compressing and drying it before delivery to the end user.



Source: Purac/USA

Economic Advantages Of Biogas

- The only renewable energy source that directly reduces greenhouse gas emissions and generates energy!
- Provides direct opportunities for economic and environmental advantages.
- Broad range of application
- Biogas Production is a vital component of the overall goals of the LAEDC Green Task Force in the promotion of robust 'green business' strategies.

The End



Questions & Answers

- Q & A
 - Questions?
 - Comments?
 - Discussion ...