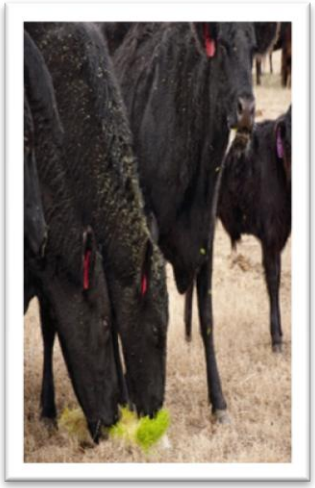
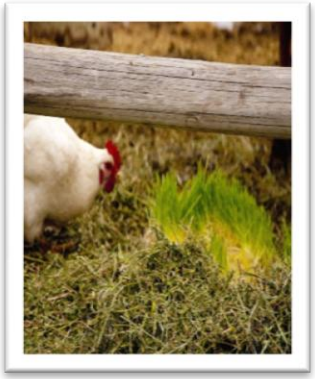
Self Sustaining Dairy Farming

High Performance Feed & Waste to Value Technologies





Welcome

Seed To Feed In 6 Days

Introduction

- Total Quality Life Maintenance Associates Our Story:

TQLMA Group of Companies was created at Institute of Business Management as an Incubation Company to inculcate Total Quality Life Maintenance Processes in Hard Working Families of our World.

TQLMA is a leader in cutting edge technology in the combined fields of agricultural, hydroponics, and renewable energies. With our current efforts our company is on the verge of some explosive growth and we would like to share this information with you!

There are a lot of companies out there that have ideas on how to address many of the issues that our modern society is dealing with. For example; food shortages, energy issues. Well TQLMA not only has ideas, but we are on our way to implement our Innovative Life & Business Maintenance Processes Globally.

One of the other areas that our company is working on and will be close to launching this product line in the Summer of 2014 (based on additional funding) is human consumption growing systems.

TQLMA is already working on processes to tap into some new and emerging markets. For example;

Ethanol Feed Stock growing systems: Switch grass, sorghum, and etc.

Bio-mass Feed Stock growing systems for power generation

Many other process that we can explain later

Definition of our AFS Systems:

- **What is a *AFS* system?**
- The system is a hydroponic portable growing room that has been specifically developed to sprout grain and legume seeds for highly nutritious yet cost effective livestock feed.
- A selection of grains and legume seeds are spread onto the specialized growing trays and are watered at pre-determined intervals with overhead sprays. A set temperature is maintained inside the chamber to ensure the best growth and highest nutritional value fodder possible.
- Each day you simply slide the feed out of the trays, rinse the tray, reseed and push the newly seeded tray into the other end. The system holds enough trays so your desired amount of feed is available everyday.
- The sprouts grow on the TQLMA's specially designed sprouting trays with no growing medium.
- Feed quality barley germinates within 24 hours of seeding. The barley grows in the same tray for 6-days and is ready for harvest as a 6 to 8in high grass mat.

Definition of AFS Systems Cont.

- Generally it takes six days to grow from seeding to feed out. This can vary by 24 hours depending on how well you maintain a consistent temperature inside the system.
- The “sprout mat” is completely edible and highly nutritious as it is a living food. The animals will eat the entire mat, roots and green growth so there is no waste.
- ***AFS systems*** do not add any nutrients. Our years of research and economic studies of nutrients prove that nutrients are neither viable nor necessary.
- Only a single phase 110/120 Volt 30 amp power supply is needed. The rooms come complete ready to plug a 30 amp lead into the power socket.
- The systems cost no more than $2/day in power costs to run as they are very well insulated and designed to be extremely power efficient.
- The systems can be used outside in a paddock but naturally they will perform better with lower running costs inside a shed or out of direct sunlight in the summer months.
- ***AFS Systems*** technology offers low operating costs and requires minimum labor. Depending on the system size, typical operation takes from only **15 to 60 minutes per day to harvest**, clean and seed the ***AFS*** system.
- ***AFS*** systems range from 60lbs/day through to 1500 lbs/day.

Nutrition & Benefits

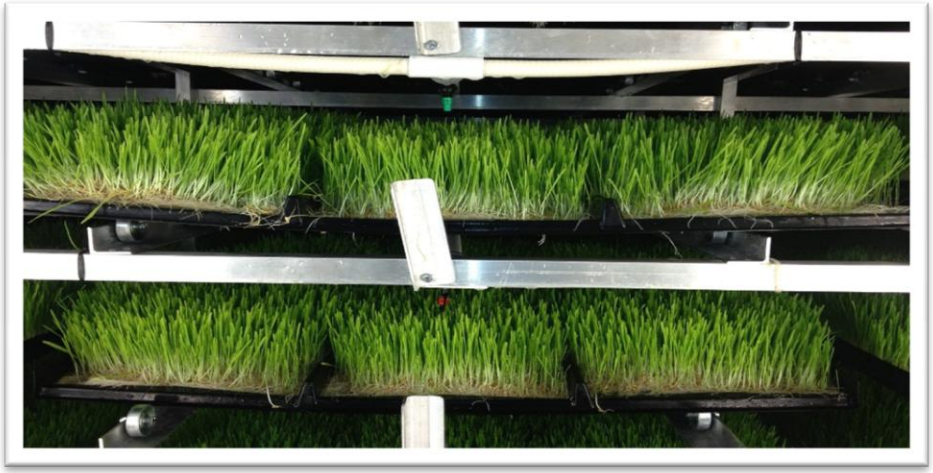
Nutrient	Units (DWB)	6 day old barley sprouts grown in a AFS System	Grassy hay	SFB (steam flaked barley)	SBM (soya bean meal)	Chaff
Protein	%	15.27-22.55	19.9	11.7	44.3	19.9
Fat	%	3.00	1.3	3.3	16.3	1.3
Moisture	%	78.83	10.1	11.6	8	10.1
Ash	%	3.17	8.7	2.8	5.6	8.7
Crude Fibre	%	10.47	33.3	3.6	5.2	33.3
ADF	%	14.43	36	6.2	7.5	36
NDF	%	28.63	52.4	17.7	10.2	52.4
DE	MJ/kg	13.33	9	14.9	15.4	9
Starch	%	18.15				0.5
Fructans	%	0.70				

Benefits of Sprouting grains and legumes:

- Being able to grow your own highly nutritious feed on farm for only 4c/lb on average
- Forget about waiting for rain or soil moisture to plant
- No more moving irrigation lines, plowing fields, mowing, windrowing, bailing and hammermilling.
- Save on feed prices - Instead of paying high feed prices in tough times you can hedge your investments, buy when others are selling their stock cheap and sell when others are paying high prices. With a ***AFS*** system you can **take control of your feeding and production**.
- Organic and affordable - Growing demand for economical “natural” animal feed as well as concerns relating to animal feed safety and the environment make ***AFS*** systems an attractive means of producing affordable organic “green” feeds

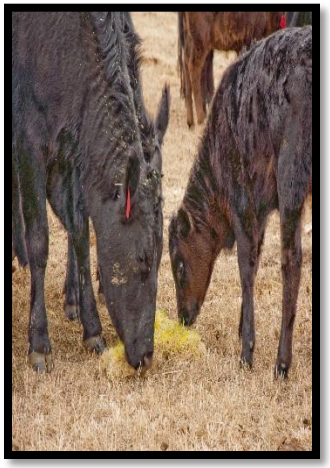
Nutrition & Benefits Cont.

Taylor your seed blends to meet your nutritional needs



Additional Applications

- Reduction in carbon foot print
- Reduction in water consumption
  - Water consumption is minimal and passed through irrigation water can be used for animals.
  - The system uses **only 0.5 gallon** of water to produce **2.2 lb** of green grass. Conventional growing methods require about 21 gallons of water.
  - This represents an **incredible water saving** – using as little as 1/20 of a regular farm and little impact on the water table from water use and farm chemical run-offs.



- Reduction in land usage
- Time Saver

We also have people sprouting various other crops in these systems.

- Human consumption sprouts
- Trees
- Flowers
- Many other crops

Daily operations of the system

- Every model of ***AFS System*** hydroponic feed production systems contains a racking system complete with:
- growing trays
- irrigation equipment
- lighting
- a heating and cooling ventilation system
- controls to maintain optimal environmental conditions.
- The ***AFS*** system maximum feed production is maintained through the use of the biomass growing that maintain a consistent environment.
- The smaller ***AFS*** systems are factory assembled and shipped ready for easy site installation. A flat and solid base, and only simple electrical, water and drainage hook up is required. Solid construction, reliable state-of-the-art equipment ensure trouble-free “constant” production in often-harsh operating environments.
- Operational consistency is ensured through sound engineering, solid construction and demonstrated operational performance. With over 18 years combined experience, the ***TQLMA*** team has a reliable track record in fabricating and assembling hydroponic systems.

Return on Capital Purchase

Production Unit	**AFS-8**	**AFS-16**	**AFS-24**	**AFS-66**	**AFS-99**	AFS-115	**AFS-172**
Cost per ton of high quality grain feed	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00	$400.00
Savings per ton (approx)	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00	$300.00
Daily fodder production (approx)	50 pounds	100 pounds	145 pounds	400 pounds	600 pounds	700 pounds	1000 pounds
Yearly Production & Savings (approx)	8.3 Tons $2490	16 Tons $4800	24 Tons $7200	66 Tons $19,800	99 Tons $29700	115 Tons $34,500	172 Tons $51,600
Winterized Unit cost ***Does not include Shipping & Tax***	$8000	$11000	$13000	$18,800	$23,500	$25,500	$32,800
Return on Investment (approx)	3.2 years	2.3 years	1.8 years	1 year	9.7 months	9.4 months	8.1 months

Anaerobic Digestion: Changing the Waste Perspective

The Mission
Solving Waste Management Across Multiple Sectors

Agricultural

Municipal

Industrial

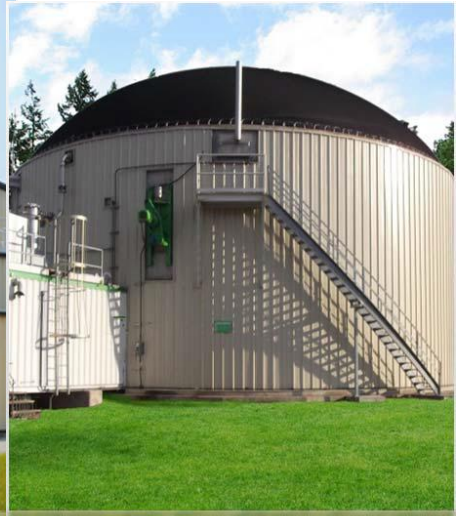
The Mission

Solving Waste Management Across Multiple Sectors

Universities

Agricultural

Municipal



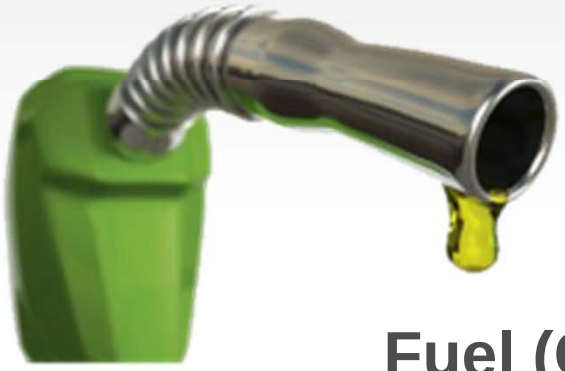
Industrial

Taking Advantage of Organic Waste

Food Waste

Anaerobic Digestion

Electricity



Fuel (CNG)

Anaerobic Digestion
Breaking Down the Process

Naturally occurring biological process

Microorganisms break down biodegradable material in the absence of oxygen

Methane, carbon dioxide and water are produced (biogas)

Biogas
“On Demand” Renewable Energy

Biogas is the most **multi-talented of all the renewable energies, as it can** produce electricity, heat and fuel. It’s not subject to changes in weather, allowing for continuous production.

Biogas Production Process
The Basics

1. Input
2. Process
3. Product

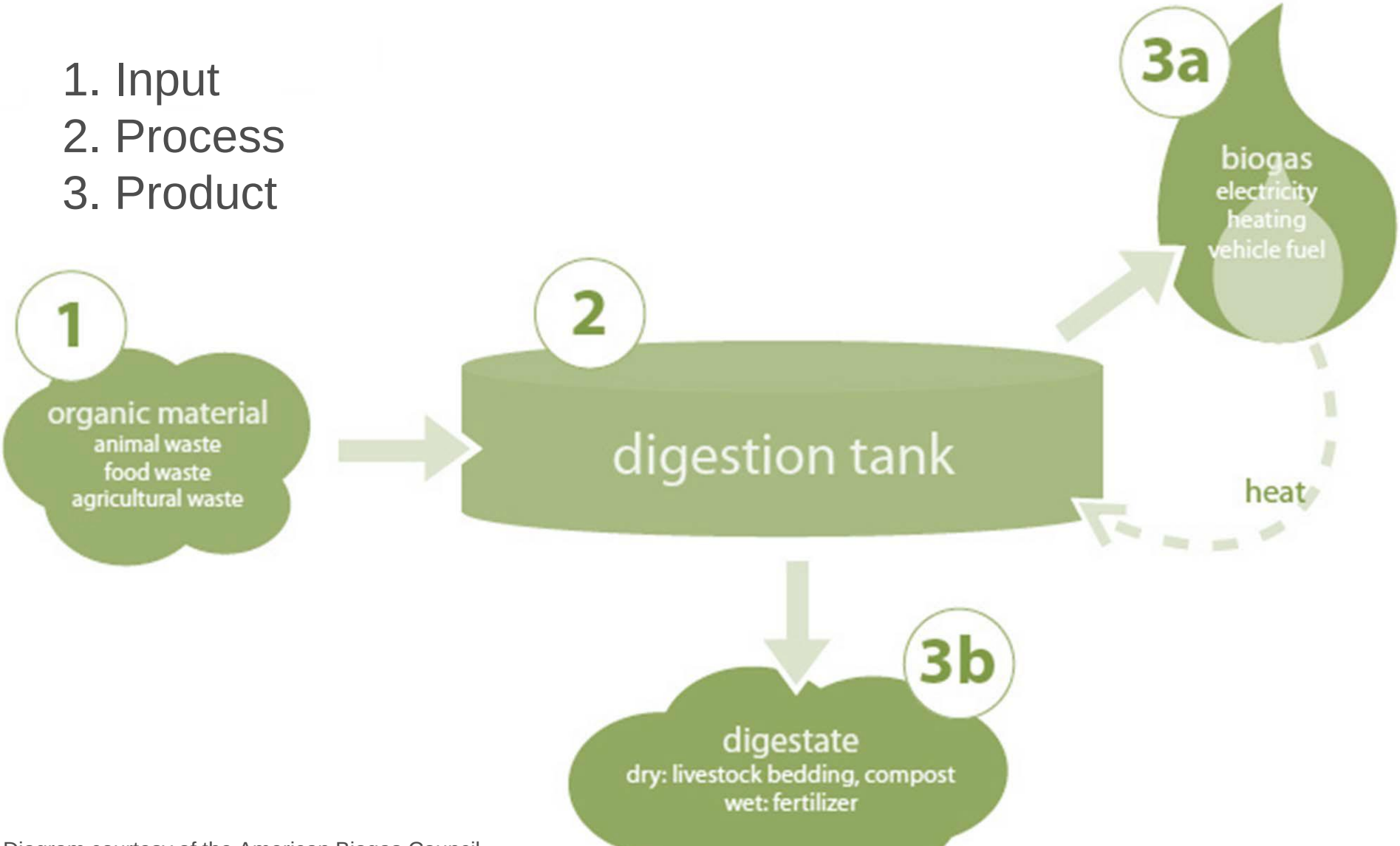


Diagram courtesy of the American Biogas Council

Systems Solutions
A System for Every Waste Stream

Dry Fermentation Biodigester

Small-Scale Biodigester

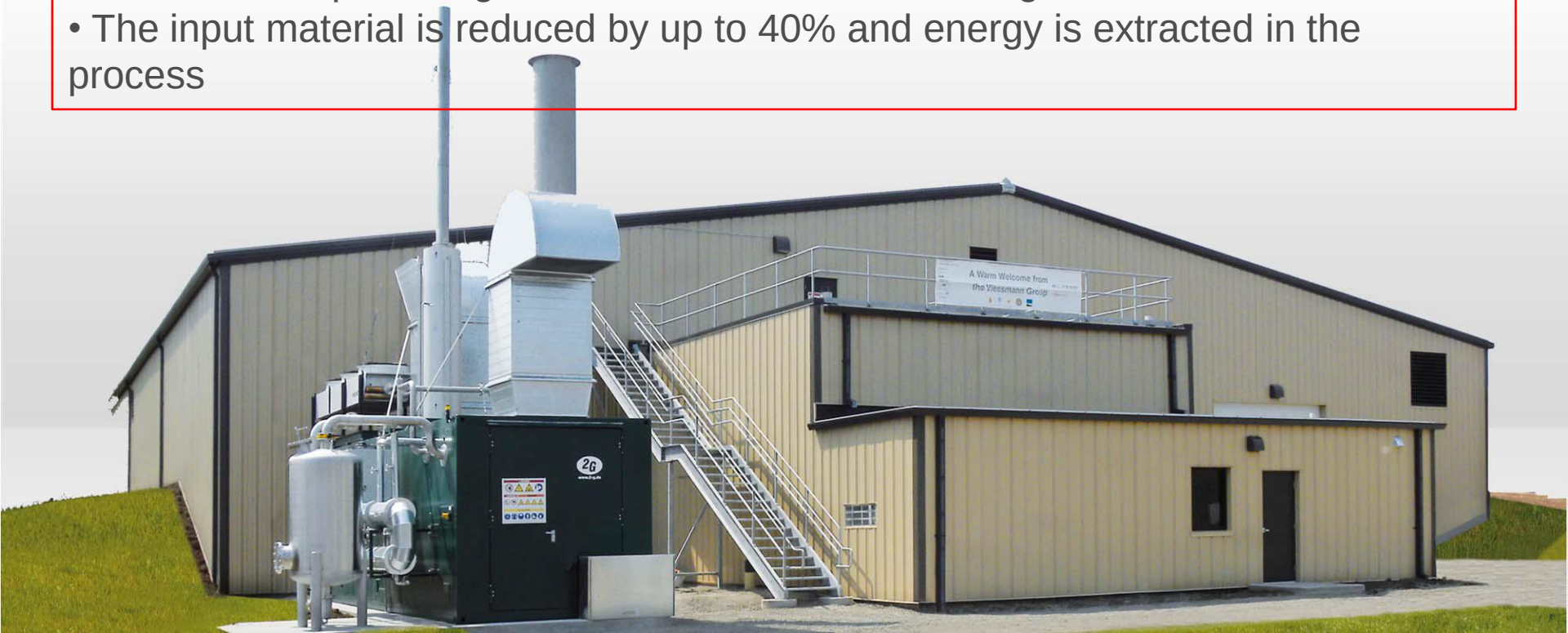
Wet Fermentation Biodigester

Municipal and Waste Management
Dry Fermentation System

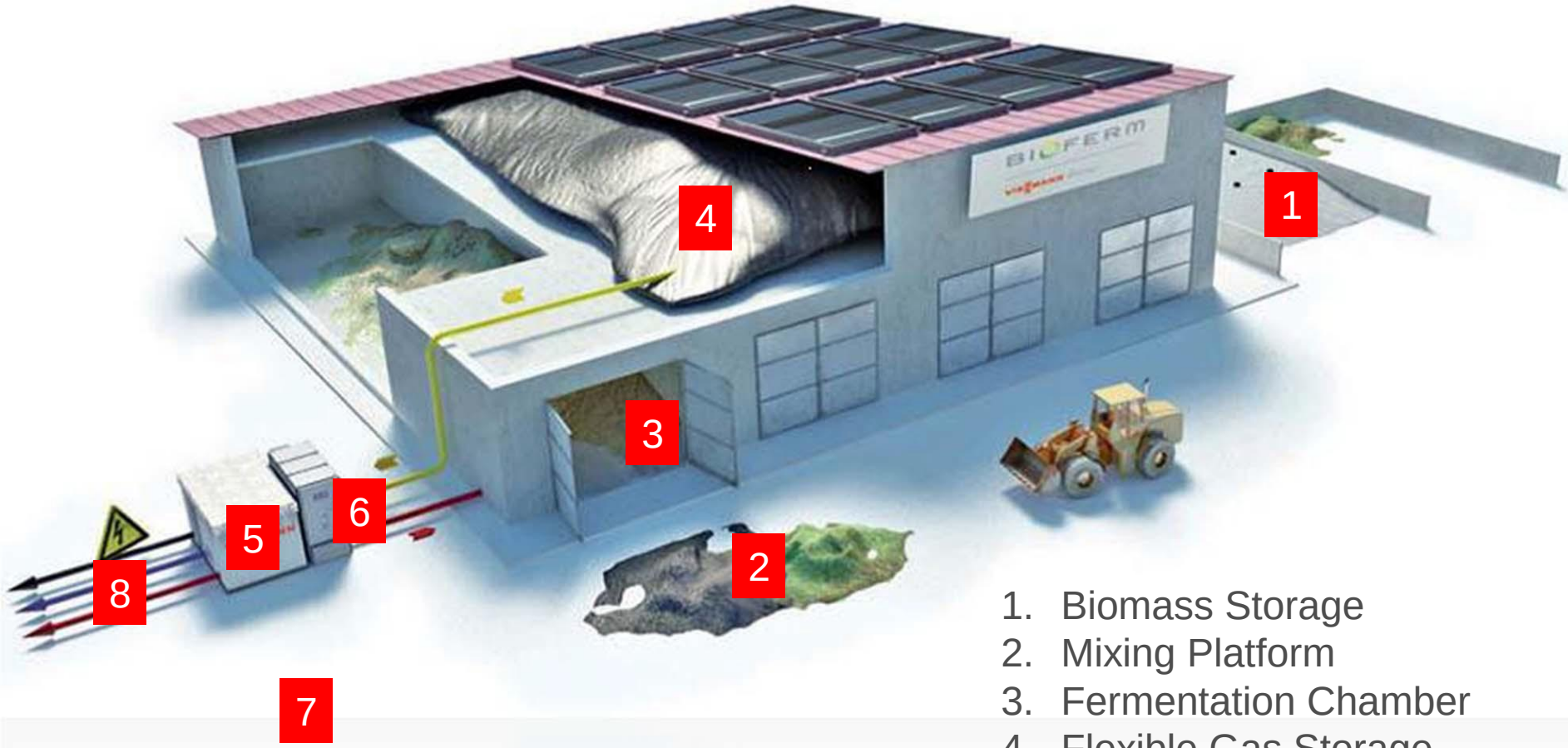
Municipal and Waste Management
Dry Fermentation System

Municipal and Waste Management
Dry Fermentation System

- The BIOFermTM industrial grade dry fermentation anaerobic digestion process uses organic input materials to produce biogas
- A batch system - reloading on a 28 day cycle
- Minimal additional water required
- Material stays stationary, while bacteria (percolate) is sprayed over it to accelerate the decomposition process
- Percolate seeps through the biomass and is reused again
- The input material is reduced by up to 40% and energy is extracted in the process



Municipal and Waste Management
Dry Fermentation System

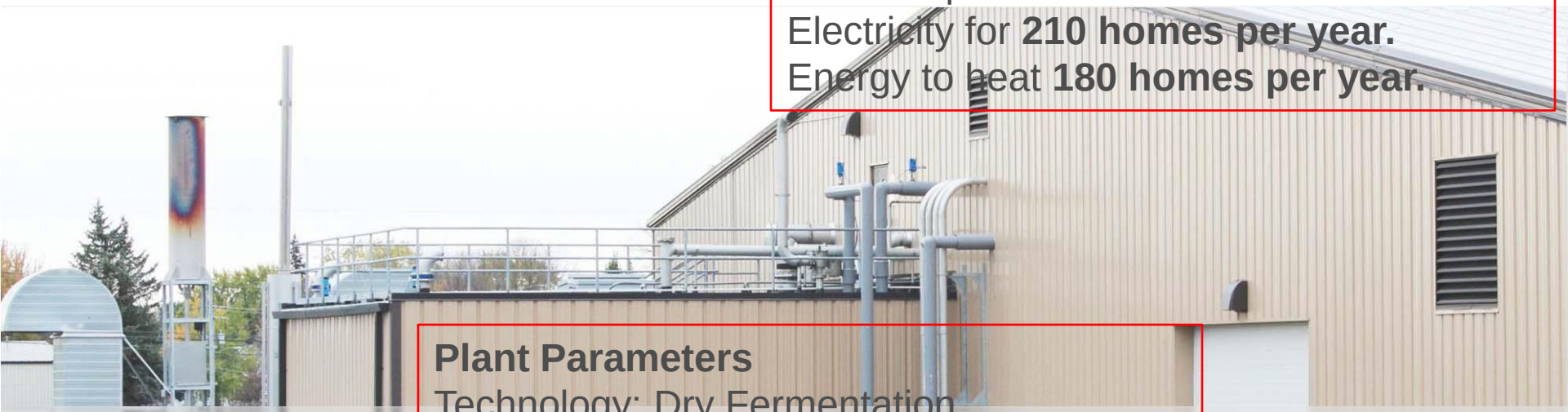


1. Biomass Storage
2. Mixing Platform
3. Fermentation Chamber
4. Flexible Gas Storage
5. Biogas Boiler
6. CHP
7. To District Heating
8. Electric Grid Connection

Case Study
The University of Wisconsin– Oshkosh

- $3.5 million capital investment
- Federal government grant: $500,000
- State of Wisconsin)$232,587

UW Oshkosh's biodigester provides up to **10% of their electricity needs on campus.**
This is equivalent to:
Electricity for **210 homes per year.**
Energy to heat **180 homes per year.**

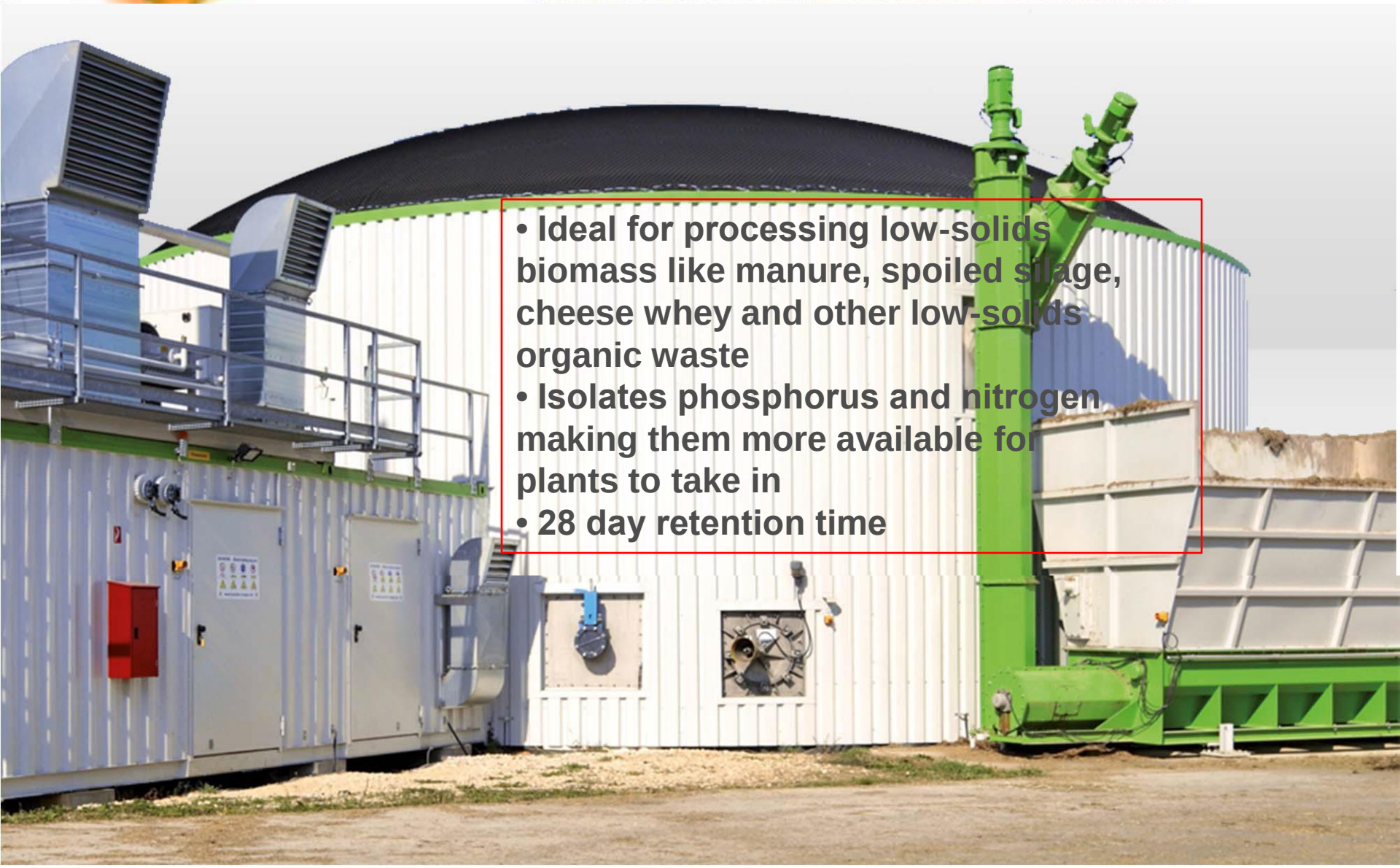


Plant Parameters
Technology: Dry Fermentation
Installed electrical capacity: 370 kW
Installed thermal capacity: 495 kW
Input material: up to 8000 tons agricultural waste and SSO
No. of fermentation vessels: 4
Length x Width x Height: 65 ft x 23ft x 13 ft
Construction start date: September 2010
Beginning of operations: Summer 2011

Case Study
Waste stream

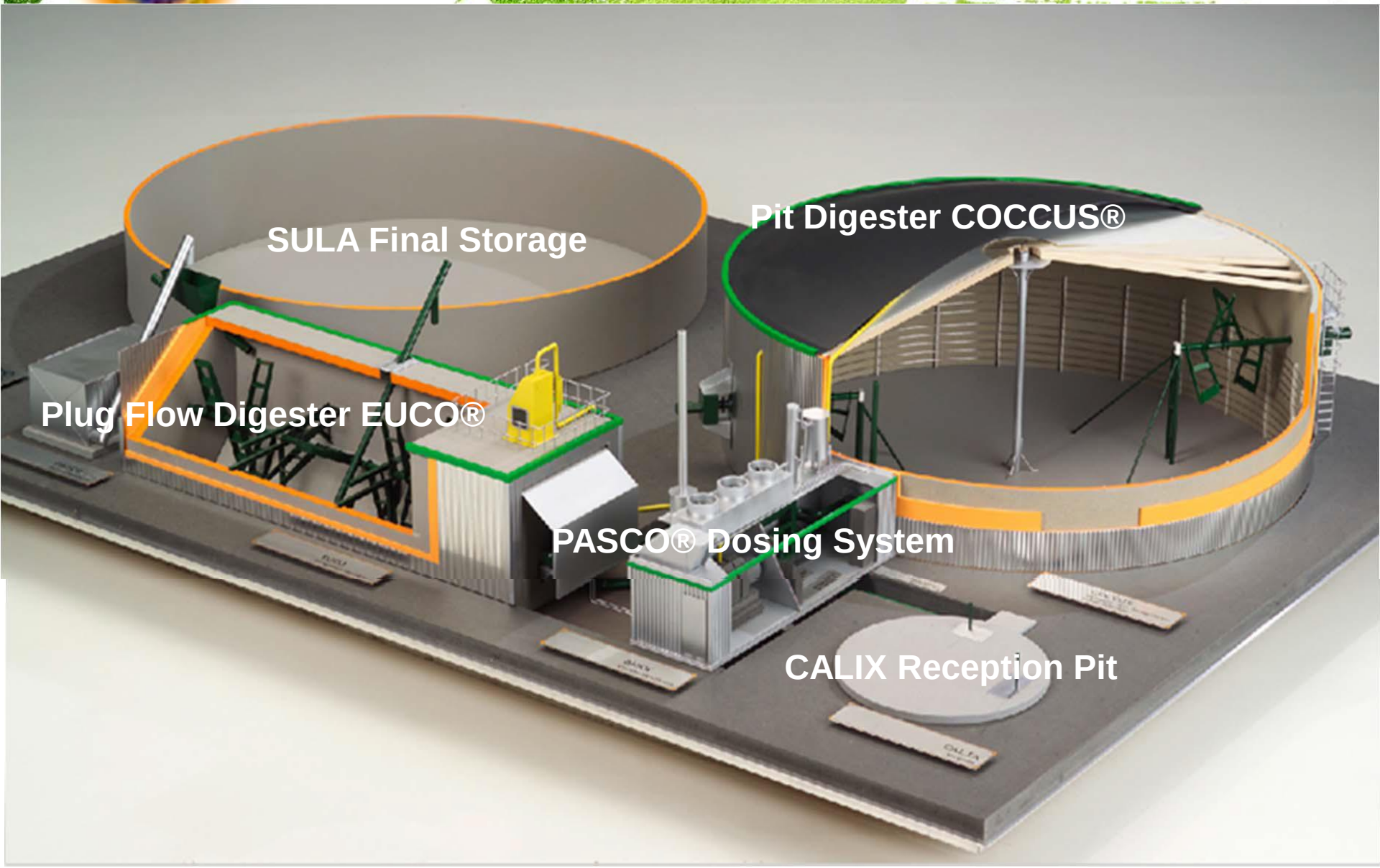
- Food waste from local grocery stores and restaurants
- Yard waste consisting of grass clippings, leaves, brush, shrubs and tree clippings
- Post-consumer food waste University cafeteria
- Animal bedding from local farmers

Complete Mix
"COCCUS"



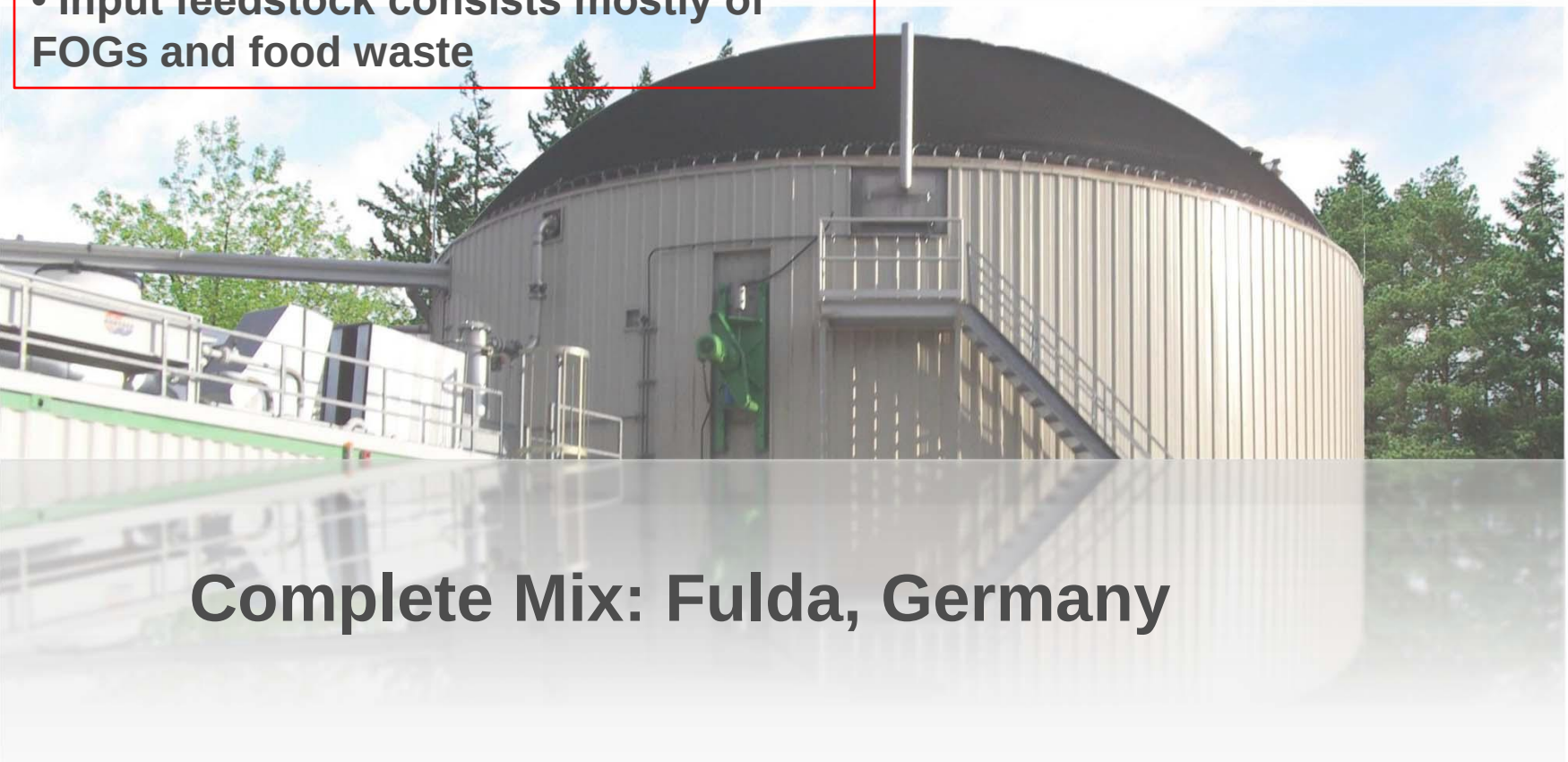
- Ideal for processing low-solids biomass like manure, spoiled silage, cheese whey and other low-solids organic waste
- Isolates phosphorus and nitrogen making them more available for plants to take in
- 28 day retention time

Complete Mix Biodigester



Case Studies
Reference projects

- 2 COCCUS fermentation tanks, 4 SULA storage tanks
- Capacity: 35,400 tons per year
- Total footprint: 310,000 square feet
- Produces approx. 19,600 MWh of gas
- Input feedstock consists mostly of FOGs and food waste



Complete Mix: Fulda, Germany

Case Studies
Reference projects

Elmer Preut Biogas Plant
- **160 kW**
- **55,000 tons per year of manure**

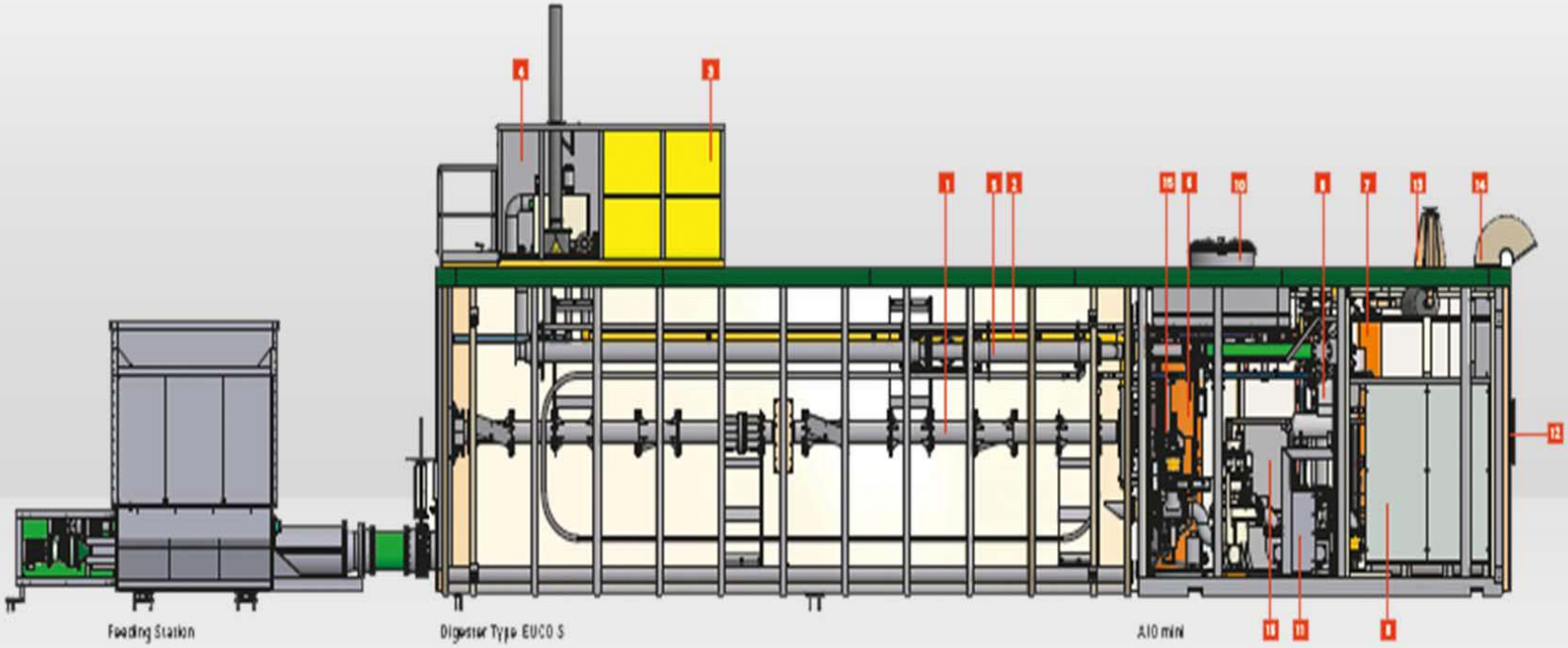
Hansjorg Joos Biogas Plant
- **250 kW**
- **12,000 tons per year of manure waste bread product, grease and other food wastes**

Plug and Play Digester "EUCOlino"

- Ideal for processing smaller amounts of manure, spoiled silage, cheese whey and other low-solids organic waste
- Isolates phosphorus and nitrogen making them more available for plants to take in
- Ideal for small food processing and farm operations

- A EUCO150 fermenter can process 1-5 tons of organic waste a day
- Standard dimensions are 50'x12'x12' (LxWxH)
- A CHP unit (40'x8'x8') would be attached to the fermenter

Plug and Play Digester
“EUCOlino”



Setup EUCOlino

Feeding Station

Digester

1. Agitator
2. Gas piping
3. Gas storage
4. Overpressure valve/measurement technology/slurry thickening
5. Heat exchanger (pipe in pipe)

AIO mini

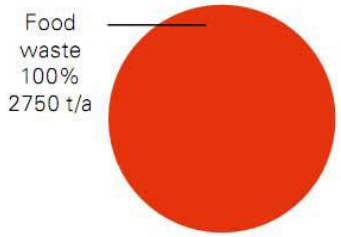
6. Desulphurisation
7. Exhaust gas heat exchanger
8. Electrical engineering and plant control system
9. Heating distribution
10. Emergency cooler
11. Pump
12. Control-panel
13. Exhaust
14. Intake air
15. Gear motor
16. CHP

Plug and Play Digester

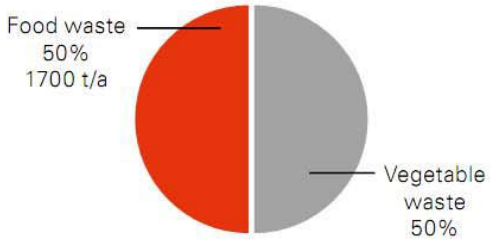
Feedstock types and outputs

Food waste
TS 16%
oTS 87 %

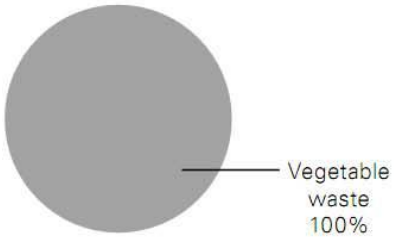
Maximum food waste use



Possible use



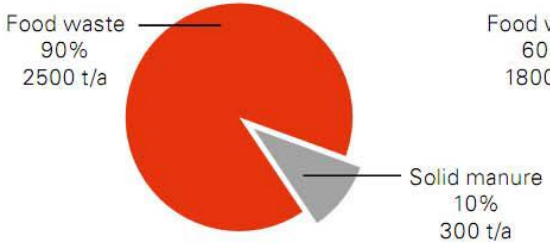
Maximum vegetable waste use



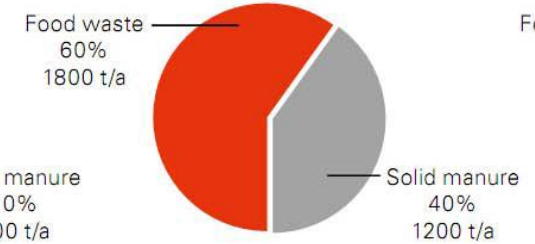
Vegetable waste
TS 15%
oTS 90%

Food waste
TS 16%
oTS 87 %

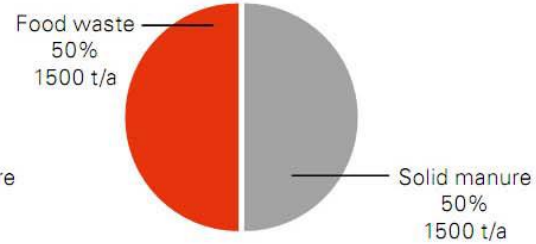
Maximum food waste use



Possible use



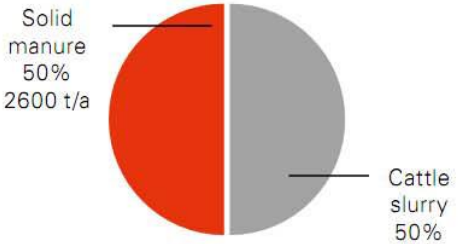
Maximum solid manure use



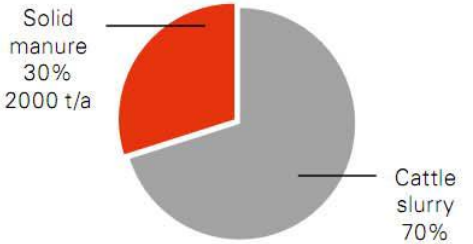
Solid manure
TS 24%
oTS 82 %

Solid manure
TS 24 %
oTS 82 %

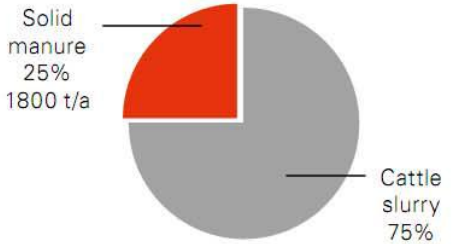
Maximum solid manure use



Possible use



Maximum cattle slurry use*



Cattle slurry
TS 8%
oTS 80 %

* 100% possible, but dwell time < 15 days

Case Studies
Reference projects

Compact Biogas Plant: Landwirtschaftszentrum Eichhof

- Plant type: EUCOlino 36 kWel
- Feed-in capacity: approx. 288,000 kWh/a
electric and 324,000 kWh/a thermal output;
potential electric power requirement for approx. 74 households as well as supply heat for approx. 18 households.
- Input material: mix of cow slurry, corn and
grass silage, manure.
- Operational since June 2012

Case Studies
Reference projects

Compact Biogas Plant: Schwandorf

- **Plant type: EUCOlino 15 kWel**
- **Feed-in capacity: approx. 120,000 kWh/a electric and 135,000 kWh/a thermal output; potential electric power requirement for approx. 31 households as well as supply heat for approx. 7 households.**
- **Input material: mix of cow slurry, corn and grass silage, manure.**
- **Operational since summer 2011**

Case Studies
Reference projects

Compact Biogas Plant: Herrmannsbrunn

- **Plant type: EUCOlino 75 kWel**
- **Feed-in capacity: approx. 600,000 kWh/a electric and 675,000 kWh/a thermal output; potential electric power requirement for approx. 155 households as well as supply heat for approx. 38 households.**
- **Input material: cow slurry, corn and grass silage, manure.**
- **Operational since December 2011**

Myths and Truths of Anaerobic Digestion

Myth: “Anaerobic digesters smell.”

Truth: Digesters are NOT smelly, but the substrate and how you handle it can be odorous.

Because the anaerobic digestion process happens in an airtight container, most of the odors are prevented from being released into the air. The digestate that comes out of the biodigester smells “earthy” but not unpleasant.

The dry systems are enclosed and under a biofilter containing and filtering odors.

Myth: “All the valuable nutrients are lost in the digestion process.”

Truth: This is not true. During digestion volatile organic compounds are converted to biogas. *Carbon and hydrogen (CH4) are* the primary nutrients leaving in the form of biogas.

During the anaerobic digestion process any *nitrogen, phosphorous or potassium in the manure and food waste is* converted into more easily absorbable nutrients.

Volatile organic compounds which smell the worst, anaerobic digesters significantly reduces odors.

Myths and Truths of Anaerobic Digestion

Myth: “Anaerobic digesters just don’t work.”

Truth: Anaerobic digesters have been around for over 200 years. Since their conception, digesters have been used worldwide to treat wastewater, power homes and as a clean source of renewable energy.

In 2010, 162 anaerobic digesters generated 453 million kWh of energy in the United States in agricultural operations, enough to power 25,000 average-sized homes.

Germany leads the European nations with 6,800 large-scale anaerobic digesters, followed by Austria with 551.

Electric & Fuel Potential
Power from Food Waste

- 1.3 Billion tons of Food Waste = 356,000,000 MWh electricity per year
- Average home consumes 11,496 kWh/year
- 356,000,0000 MWh electricity = 30 Million homes
- Power 86% of the homes in Pakistan

- 33.8 million tons of Food Waste = 622,000,000 GGE of CNG
- 622,000,000 GGE = 1,166,000 cars
- Population of Connecticut = 3,580,709
- Fuel 1/3 of Connecticut's Vehicles

Self Sustaining Dairy Farms in Karachi

Landhi Cattle Colony has 1600 Farms on 1600 Acres housing 400,000 Buffaloes and Cows (95% Buffaloes) producing 4 Million Liters of Milk and 7200 Tons of Manure to produce 25 MW Power & 1500 Tons of Organic Fertilizer

- 400,000 Buffaloes & Cows = 4 Million Liters of Milk per Day
- Monthly Profit from Milk Sales = Rs 24 Million
- Monthly Profit from Power @ US$0.1/KWH = US$ 18,00,000
- Monthly Profits of Organic Fertilizer @$100/T = US$ 150,000
- Total Monthly Profits = US$ 25,950,000
- Cost of AFS + AD System = US$2000/Cow = US$ 800 Million

Financed via US$500,000 Dairy Farm + Plant to 1600 Dairy Farmers

- Payback in 32 months

Thank You!

www.TQLMA.com
+92 333 228 3257
drmufaddal@gmail.com

Please contact us for more product information and or investment interests