

# Biodiesel from Waste

## Opportunities and Challenges

Alpha **Biofuels**

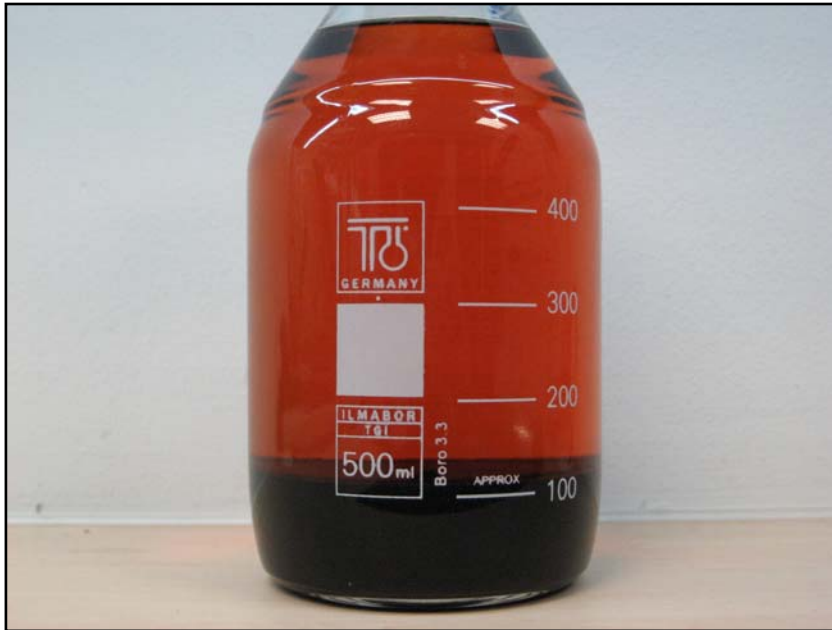


# Alpha **Synovate** Pte Ltd

- Design and Develop Biofuels Technologies
- Our Business Philosophy
  - Energy from non food competing feedstocks
- Commercial projects :
  - Biodiesel from Waste Vegetable Oils
  - Micro Refinery for Angkor Hospital for Children based on waste vegetable oils.



# Biodiesel



- Biodiesel is also known as methyl ester
- Has the same combustion properties as fossil derived diesel.
- The raw source for biodiesel is edible vegetable oils and/or animal oils



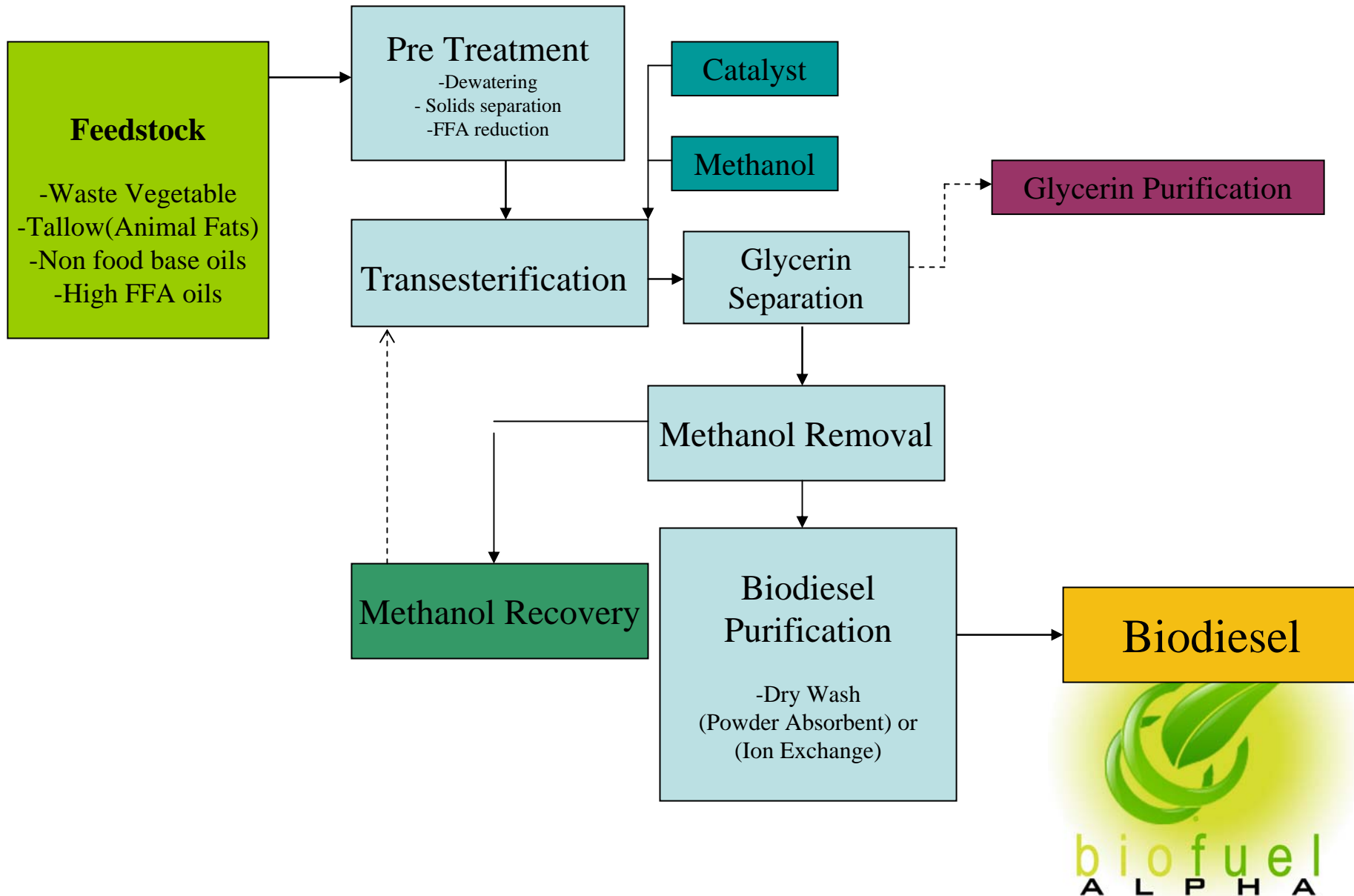
# Alpha Biodiesel Test Plant



# Alpha Biodiesel Trial

QuickTime™ and a  
mpeg4 decompressor  
are needed to see this picture.

# Alpha **BD1500** Process



# Alpha **BD1500** Micro Plant

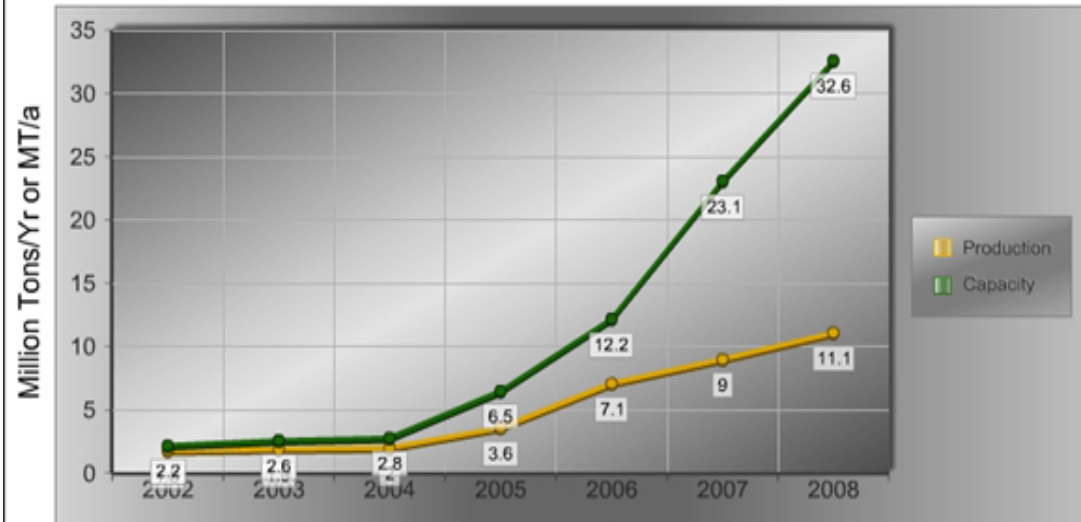
- Batch Processing
- Capacity
  - 8 Mt ton of feedstock every 24 hour
  - Expected 200 Mt biodiesel per month
- Dry Wash System
- Modular component



# The Feedstock Controversy



## World Biodiesel Production and Capacity



source Biodiesel 2020: A Global Market Survey, 2nd edition



# Biodiesel Challenges

- Current Feedstock Options
  - Crude Palm Oil (3000RM/Ton)
  - Rape Seed / Soy oil/Corn/Canola
- Main price driver
  - Global food shortage
  - Inflationary factors
- Environment and social/political issue
  - Deforestation
  - GHC from planting methods
  - Food vs Fuel



# Biodiesel Challenges

- Resultant Action

- Biodiesel production from current feedstock type not feasible
- Urgency to look into new alternative feedstock
  - Jatropha / Algae / Waste Oils / Tallows
- Emergence of new technologies
  - BTL/GTL
  - Catalyst
  - Carbon sequestration
- Emergence of new business concepts
  - Small Scale refinery
  - Collaboration between clean technologies



# WVO as Biodiesel Feedstock

- Feedstock Quantity

- Low volume compare to CPO
- Eg. Singapore  
Maximum estimate 800 Mt/months

- Feedstock Quality

- Varies with batches
- FFA from 1% to 50%

- Pretreatment process complicated

- Yield

- Range from 50% to 90%

- Low Cost

- 30 to 40% cheaper

- Non food competing

- Biodiesel Quality

- Identical to CPO

- 1 : 2.5 GHC Reduction

(source : UNFCCCC AM27)

- Low energy consumption



# Micro Refinery Concept

- Capacity (200 MT/Month)
- Low startup cost
- Batch processing
- Tradition Transesterification
- Supports small business/communities
- Feedstock collected from community
- Integral part of municipal waste management

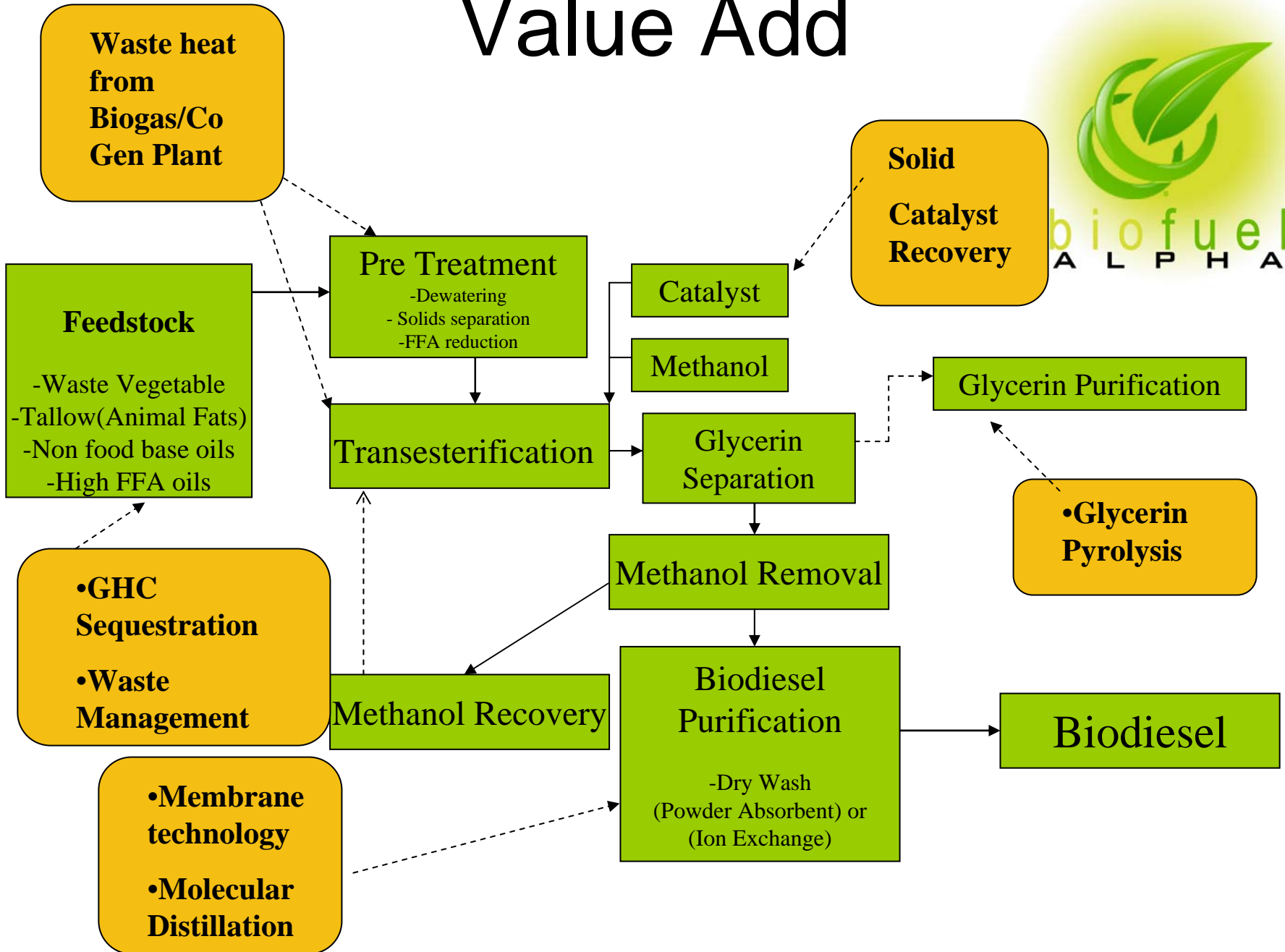


# Micro refinery concept

- Batch Processing
  - Flexible feedstock options
- System can duplicate easily in many cities
- Minimum environment impact
- However,
  - Process cost is higher than big refinery
    - No economy of scale
  - Lack of technology advancements/research
    - More effective catalyst
    - Pretreatment of feedstock
    - Process technology
    - Cross utilization of clean energy



# Value Add



# Future of Biodiesel

## Short Term:

- Wait and See Attitude
  - Govt Subsidy/Legislation
  - Price considerations
- Technology leaning to Agrotech
- Small user base
- Blends 5% to 20%



# Future of Biodiesel

Long Term outlook:

- Biodiesel is still viable
  - Suitable feedstock candidate
- Cost a driving factor for adoption
- Higher blends : up to B100
- Emergence of “winning formula”
- Balance to the energy equation



# Alpha Biofuels

Thank You

