Bio-Based Chemicals – Concept to Commercialization

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ZeaChem: Who We Are

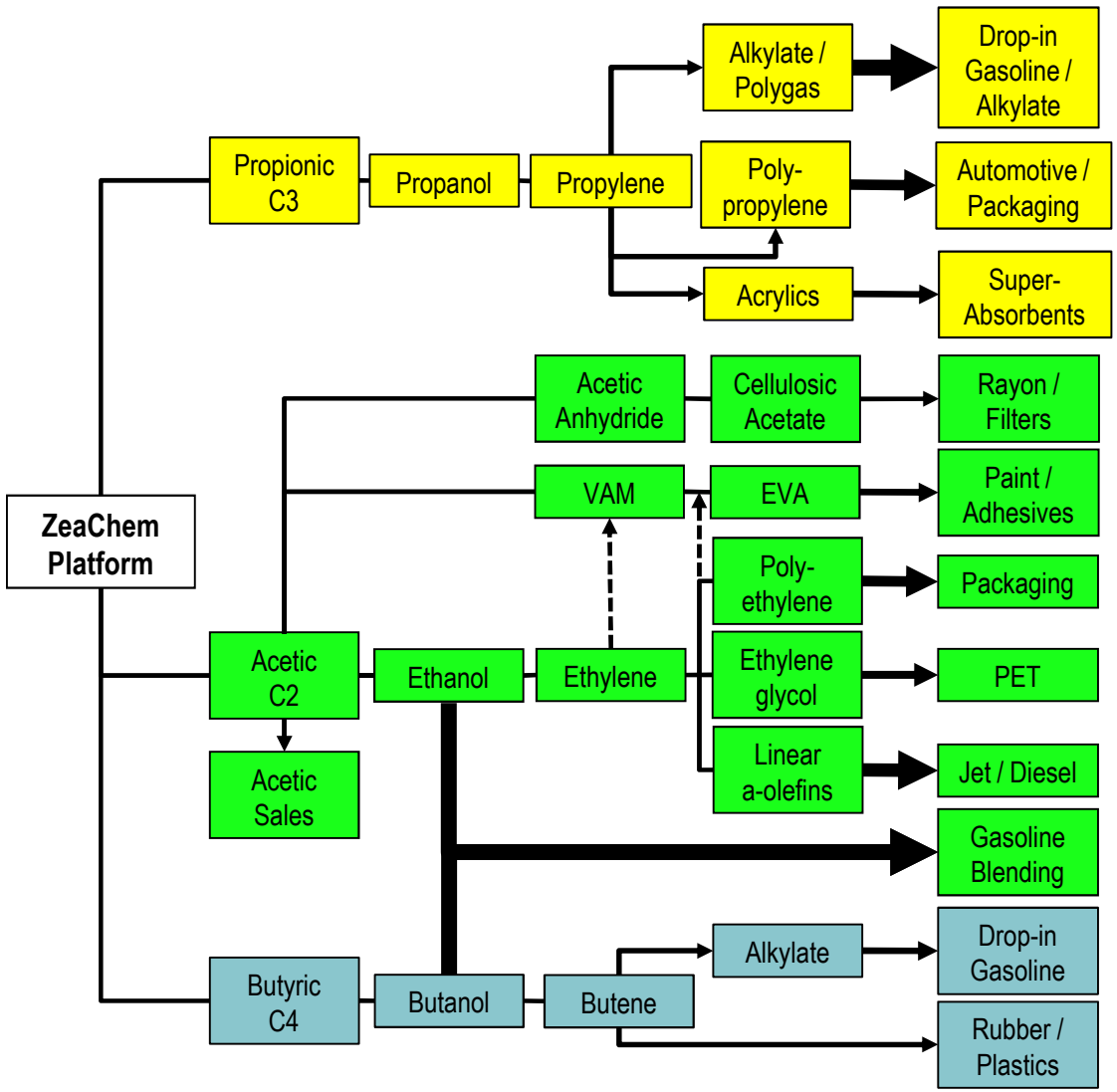
Biorefiner with Demonstrated Success

- Produce advanced biofuels and bio-based chemicals

- Advantages:
  - Feedstock agnostic
  - Dedicated / Sustainable/Existing energy crops
  - Novel integration of known processes and natural organism
  - 40% yield advantage
  - Diverse product portfolio addresses multiple $billion opportunities

- Competitive with lowest cost alternatives

Multiple Fuel and Chemical Products



	Market Size	Customers
Drop-in Gasoline / Alkylate	$485B	Refiners
Automotive / Packaging	$110B	Consumer Products Chemical Companies
Super-Absorbents		
Rayon / Filters	$180B	Consumer Products Paint Companies Chemical Companies
Paint / Adhesives		
Packaging		
PET		
Jet / Diesel	$245B	Airlines/DoD Refiners
Gasoline Blending	$60B	Refiners
Drop-in Gasoline	$1B	Consumer Products
Rubber / Plastics		

Proof of Concept for Bio-based Chemicals

Steps to Scale-up and Commercialization

1. Risk reduction
   - Technical
   - Financial
   - Market
   - Feedstock

2. Replicable business model
   - Optimize
   - Repeat

3. Partnerships
   - Along biorefining value chain
   - Create market pull

Standard Industry Scale-up Process

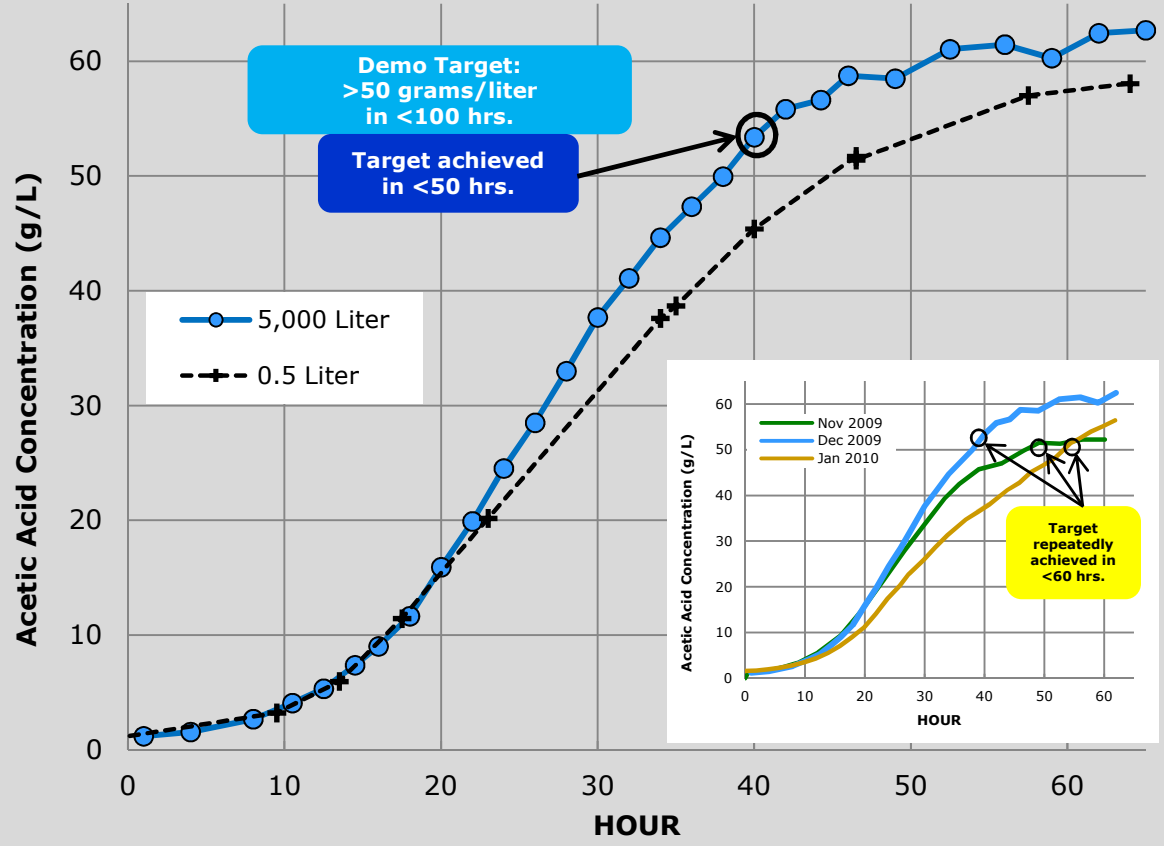
Bench → Lab → Pilot

Milestones:
✓ Proven at lab scale
✓ Raised $6MM Series A

Milestones:
✓ Proven at non-integrated pilot scale
✓ Successfully fermented mixed sugars and hydrolyzates
✓ Raised $34MM Series B

Milestones:
✓ 10,000x fermentation scale-up met and exceeded targets
✓ Completed downstream conversion:
- ✓ glacial acetic acid
- ✓ commercial grade ethyl acetate
- ✓ ethanol

Verify and Repeat Results, Make Real Products



Glacial Acetic Acid

Commercial Grade
Ethyl Acetate

Ethanol

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Replicable Business Model to Commercialize

Construction of IBR facility

Schematic of IBR and Commercial Biorefinery sites

- 250,000 GPY Integrated Biorefinery
  - Integrate technology, project finance, feedstock structure
  - Sell products to multiple customers

- 25MM GPY 1st commercial biorefinery under development
  - Optimize technology, repeat and enhance finance and feedstock deals
  - Commercial products into various markets

Long-Term Feedstock at Known Cost

Sugar Cost			
	Raw Material Price	**$/Pound**	**$/Bbl Ethanol**
Corn (C_6)	$7.60/bushel	$0.16	$94
Sugarcane (C_6)	$25/ton	$0.09	$55
Wood (C_5 & C_6)	$60/BDT	**$0.04**	**$18**

Sources: ZeaChem, CBOT and Consecana-SP Country Cane

ZeaChem Poplar Tree Broll FINAL XtraLo-Res.wmv

- Dedicated sustainable energy crops supplemented with ag residues
  - ➢ Feedstock agnostic allows for "grow where we go"
- GreenWood Resources
  - ➢ Fixed feedstock price under long-term agreement for poplar trees for commercial biorefinery in Ore.
    - Particular benefit to chemical companies, known product cost
  - ➢ Supplement with wheat straw and other locally available ag residues
- Strategy replicable through out U.S. and Globally

Partnerships that Create Demand Pull

- P&G commitment: 25% products and packaging from renewable or recyclable sources by 2020
  - ➢ No compromises; price or quality
- Worldwide search of 100+ companies
  - ➢ Why ZeaChem
    - Highest yield
    - Proven technology
    - Speed to market necessary for 2020 goals
- Joint Development Agreement
  - ➢ Develop and scale up new product platform
  - ➢ Testing at P&G's research/development labs
  - ➢ Design and cost a commercial facility

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ZeaChem Executes Joint Development Agreement with Procter & Gamble

Agreement Will Accelerate Commercialization of Sustainable Bio-based Chemicals

Lakewood, Colo. – June 1, 2011 – ZeaChem Inc., a developer of biorefineries for the conversion of renewable feedstocks into sustainable fuels and chemicals, today announced a binding multi-year joint development agreement with Procter & Gamble (NYSE: PG). The agreement will accelerate development of ZeaChem's product platform beyond C_2 through the commercialization of "drop-in" bio-based chemicals and other products.

Multiple Products, Multiple Partners

- Half of Chrysler's 2012 model year vehicles will be Flex Fuel Vehicles (FFVs)
- Strategic alliance will accelerate the market penetration of advanced cellulosic ethanol
- ZeaChem and Chrysler will collaborate on mutual goals
  - Develop strategies for increased state and government support of cellulosic ethanol production and increase consumer awareness
  - Test ZeaChem cellulosic ethanol in vehicles
  - Construct commercial scale biorefinery
- Auto industry opportunities for bio-based chemicals (paint, dashboards, cup holders)

Conclusions

- Reduce financial, technical, market and feedstock risk
- Develop a business model that is replicable
- Establish partnerships to create market pull through

Thank You

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