SyntecBiofuel

The Thermo-chemical Revolution

Presented By:
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Company

Vancouver, B.C.

Arrow Lake, B.C.

- Syntec Biofuel Inc. is a Washington State corporation based in Vancouver, British Columbia
- Company is developing proprietary catalysts & processes to convert biomass into fuel alcohols (**B2A)** via gasification

Global Fuel Mandates & Market Value

		Market Value $MM per year
	USA 24% (36 Bgpy) by 2022 (21 Bgpy from non-corn sources)	$72,000
	Canada 5% by 2010	$1,600
	UK 5% by 2010	$1,200
	EU 10% by 2020 (4% from non-food and feed-competing)	$19,830
	India 20% by 2017	$7,550
	China 10% by 2020	$10,510

Technology Overview

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Current Technologies

Fermentation	→	Corn/Sugar	→ Ethanol
Enzymatic	→	Cellulosic	→ Ethanol
Thermochemical w/ Fermentation	→	Multi-Feedstock (everything)	→ Ethanol
Thermochemical w/ Catalyst	→	Multi-Feedstock (everything)	→ Ethanol & Fuel Alcohols

Technology Advantages

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Why Thermochemical?

- Proven FT technology
- High yields of in demand liquid fuel alcohols
- Feedstock Flexible – uses any cellulosic or organic material
- Economical at a small scale (12mmgpy) - processing approximately 300dtpd of biomass
- Reduced Carbon Footprint: clean burning, CO2 neutral, no sulphur emissions

Technology Advantages

- Higher GHG reduction profile (75-94%) than traditionally produced biofuels (15-30%)
- Lignin compatible - constitutes approx 25-30% of all organic matter
- Eligible for tax + carbon credits
- Reduced water consumption
- Syngas can be used for multiple applications

Technology: Feedstock

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Corn Stover

Bagasse

Wood Residues

MSW

Technology: Process

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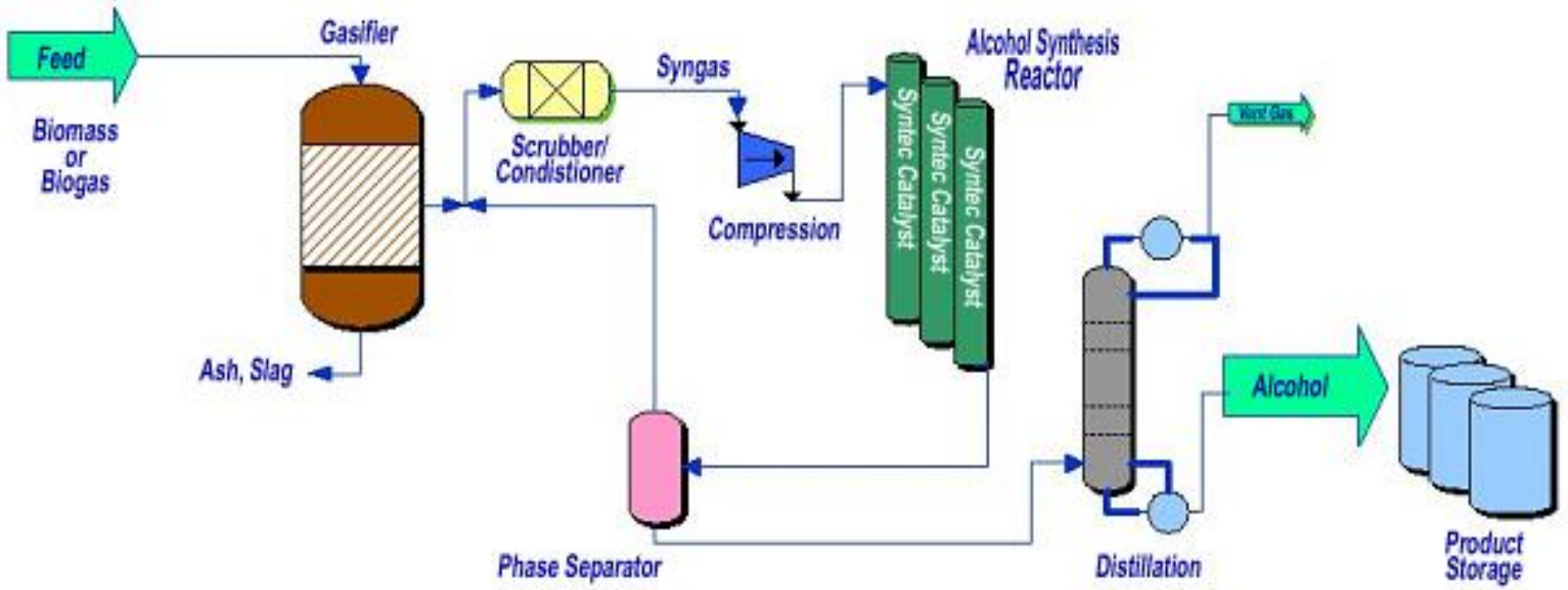
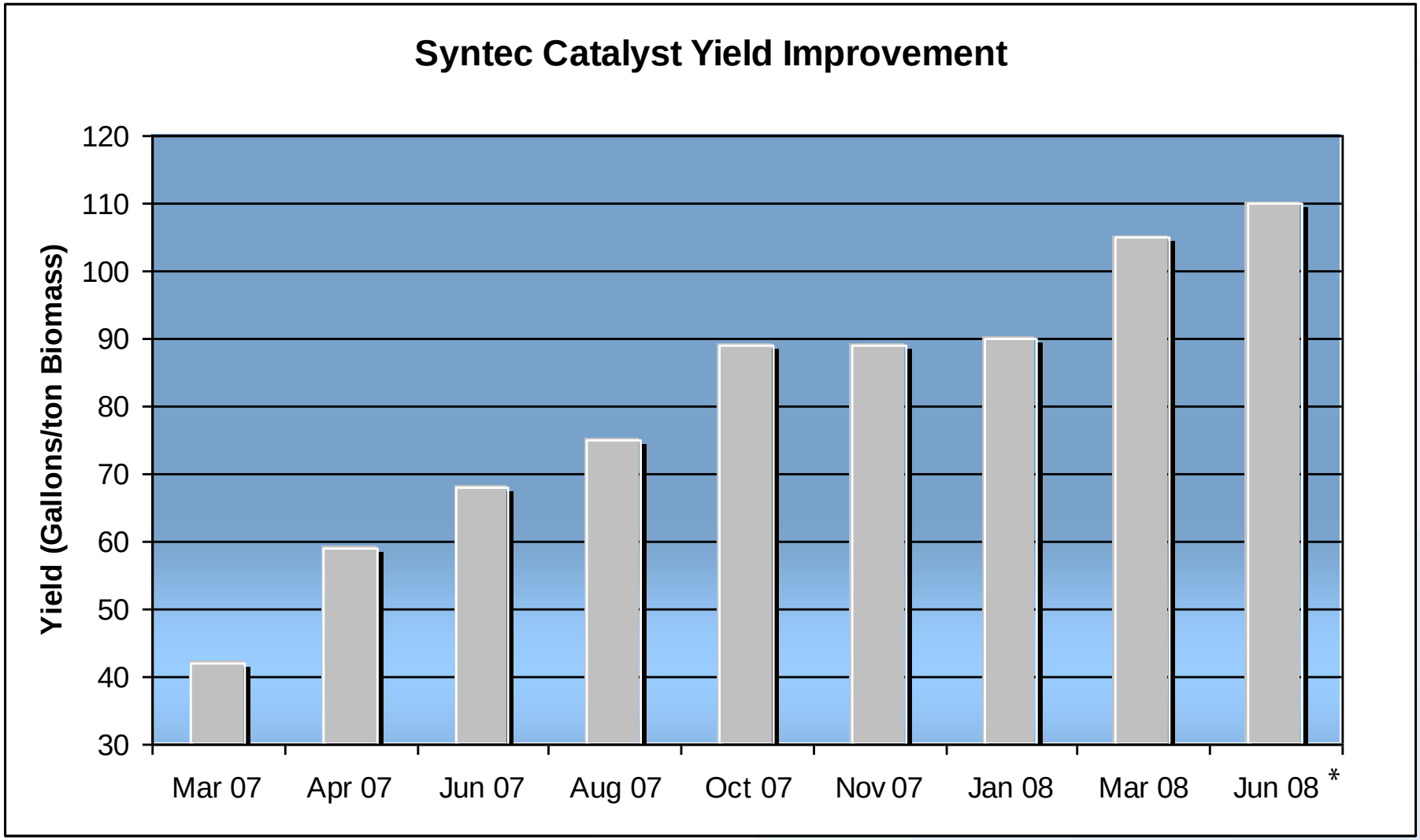
B2A Thermo-chemical Process



Catalyst Performance



175% Catalyst yield improvement in 1 year (2008)

Catalyst Yield Efficiency

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Syntec Catalyst Yields Based on Improved Efficiency				
	Current	**Future**		
Theoretical Yield (gpt)	**300**	300	300	300
Gasification Efficiency (%)	**67***	70	70	75
Catalyst Efficiency (%)	**55**	58	60	63
Actual Yield (gpt)	**110****	122	126	142

* Carbon conversion

** Currently, Syntec's catalysts have one of the highest yields in the world

Process Outputs

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Syntec Catalyst Process Outputs

Product	Current
Methanol	42%
Ethanol	38%
n-Propanol	15%
n-Butanol	5%

Comparative Economics

Manufacturing Costs ($/gallon)			
Company	Aventine	Verenium*	Syntec Biofuel
Process	Fermentation	Enzymatic	Thermochemical
Outputs	Ethanol	Ethanol	Ethanol & Mixed Alcohols
Feed	Corn	Cellulosic	Cellulosic
Yield**	90	79	110***
Feedstock Cost	$1.41	$0.44	$0.32
Operating Cost	$0.73	$0.90	$0.56
Total Cost	$2.14	$1.34	$0.88

*May 2008 Investor Presentation
** Gallon Per Ton Of Feedstock
***We expect to increase the yield to 122/142 gpt (short term)

Case Profile: MSW

- US produces approx 250 million tons of Municipal Solid Waste (“MSW”) annually. Of which 70% is available for RDF (Refuse Derived Fuel)

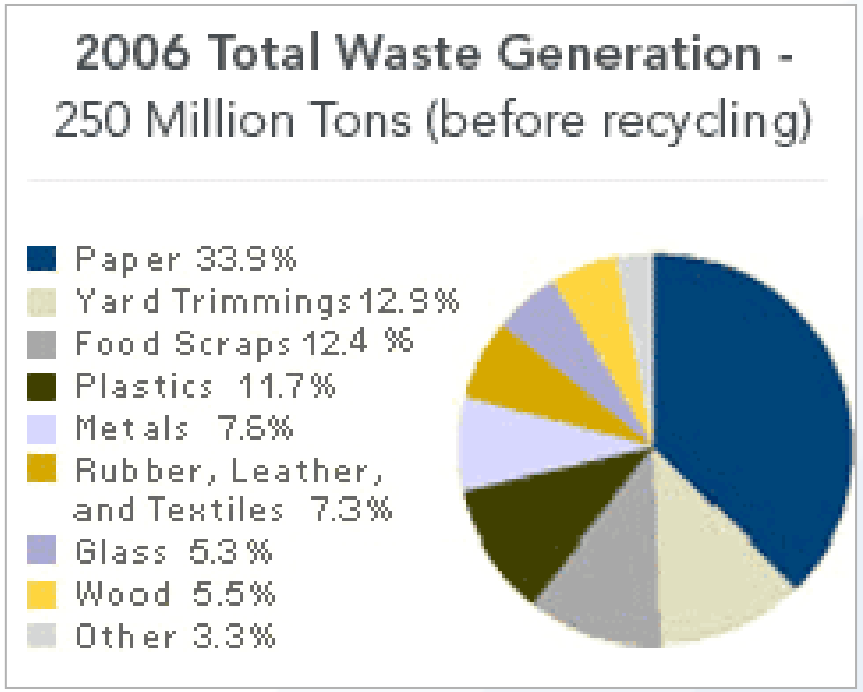

Figure 1: US Environmental Protection Agency

- As landfill space becomes more limited, MSW disposal costs will continue to escalate.

- MSW creates a global opportunity for TCP

Case Profile: MSW

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Sorting

Grinding

Drying

Gasifying

Cleaning

Syngas

Catalyst

Fuel Alcohols

Turbine

Engine

Electricity

Heat

Case Profile: MSW

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Feedstock & Cost

- MSW is a secure and continuous low cost feedstock source
- Biofuel production at substantially lower prices than those produced from other non-waste feedstocks

Integration

- TCP can be easily integrated into the existing infrastructure for collecting, separating, recycling and or disposing of MSW without adding significant logistical costs
- Such projects can reduce costs and pollution for municipalities and landfill sites, and generate revenue from liquid fuels

Process Comparison

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Process Comparison Chart

	Traditional	Cellulosic		
	Fermentation (corn)	Thermochemical (Syntec)	Fermentation (acid-hydrolysis)	Fermentation (enzymatic)
Feedstock Flexibility		●		
Higher Conversion Efficiency		●		
Greater GHG Reductions		●	●	●
Reduced Water Consumption		●		
Economical at Smaller Scales		●		

Process Comparison

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Traditional Fermentation Method

1 Bushel Corn
$4.36

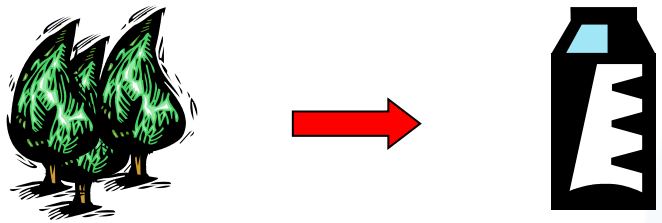
3 Gallons
$5.31

\+

18# Feed
$0.90

Gross= $1.85

Syntec B2A Process



1 Bushel Biomass
$1.00

3.2 Gallon
$5.66

Gross= $4.66

Roadmap: Industries

- The TCP process can benefit the following industries:
  - Gasification
  - MSW
  - Agriculture / Forestry
  - Saw Mills / Pulp & Paper
  - Corn/Sugar Ethanol Producers
  - Engineering Companies
  - Industrial / Chemical
  - Energy / Petroleum / Automotive

Comparative Economics

Power Generation vs. Biofuel Generation		
	POWER	BIOFUEL
CAPEX	$30M	$60M
Outputs	Electricity/Heat	Ethanol & Mixed Alcohols
Revenue	$10-12M	$24M
EBITDA	**$4-6M**	**$13M**

Roadmap: Plant Figures

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Capital Costs - 12MM gpy

Section	Cost (US$ Millions)
Wood Handling	4
Gasifier	22
Scrubber	3
Reactor	13
Separation	10
Tank Farm	3
Engineering & Construction	5
TOTAL	**60**

Roadmap: Plant Figures

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Projected Net Income – Per Plant (US$million)

Projected Net Income US$million	
Revenue	
Fuel Alcohol Sales	$24.33
Expenses	
Total manufacturing costs	$11.06
EBITDA (without tax credits)	**$13.27**
Methanol Tax Credit (USA)	$1.91
Ethanol Tax Credit (USA)	$4.68
EBITDA (with tax credits)*	**$19.86**

* excluding carbon credits

Business Model

- License our technology
  - 25 Plants over the next 5 years
- Typical Plant size is 300 TPD which produces 12MM GPY
- Revenue Model
  - License Fee US$250,000
  - Royalty Fee 7.5¢ per gallon = US$900,000 per annum per plant

Market Summary

- **Financial Risk**
  - Syntec's adopted strategy is to build smaller, lower capital cost plants to mitigate risk & reduce transport costs

- **Market Size**
  - The US market for advanced biofuels is currently $14 billion and projected to be $42 billion by 2022. We propose to capture 0.3% of this market by 2014.

- **Customer Adoption**
  - US government mandate 21 billion gallons of advanced biofuel by 2022 assures customer adoption

Summary

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The TCP process is…

- **Ecologically Superior**
  - GHG Reduction
  - Uses Waste Biomass
- **Ethically Superior**
  - Uses waste feedstock & MSW
- **Economically Superior**
  - Profitable at small scale

Summary

- TCP has the competitive advantage of high yields & low production costs
- Does not require the use of food crops or added agricultural expansion
- A wider range of input materials can be used to produce a wider variety of output fuels and is an extremely efficient method of extracting energy from biomass.
- Accommodates a wider geographical range for development
- Higher GHG reduction profile with corresponding tax and carbon credits
- Process is economically competitive at a small scale (10-40 mmgpy)
- One of the most technically and economically compelling energy possibilities for a carbon neutral economy
- There is really no competition as the market will absorb all supply. However, the most successful companies will be those with the lowest cost and highest yield

Milestones - Completed

- Patent approved for catalyst to produced mixed alcohol from biomass
- 5 years of research and filed a 2nd patent applications
- Achieved yields of 110 gpt in laboratory environment working with clean syngas
- Joined a highly respected consortium applying to DOE for funding a Pilot plant in the US
- In dialogue with UBC and EERC (University of North Dakota) to formulate a service agreement where they can use their higher-grade facilities to perform enhanced testing.

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Thank You

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