Overview

- Production of renewable low carbon fuels and chemicals from “liquid wood”
- Anchored by Ensyn’s commercial RTP process – 30 year track record
- Existing chemicals, heating & cooling business offer steady growth
- Refinery feedstock market represents a global opportunity for the production of low carbon fuels
- World-class strategic relationships across the value chain
- Commercial production in Ontario and Wisconsin – Quebec now in progress
- Additional expansion underway in Brazil and the southeastern U.S.A
Ensyn’s Business – Forest Biomass to High Value Products

Biomass Feedstock → Conversion to Liquid Biocrude → Renewable Fuel Oil (RFO) → Chemical Feedstock

Food Ingredients & Renewable Chemicals

RTP Process

Heating & Cooling

Refinery Co-processing

Refinery Feedstock (Biocrude)
Ensyn’s RTP® Technology

Maximum Conversion of Solid Carbon to Liquid Carbon

- Not “severe” – a non-catalytic, thermal process
- Similar to Fluid Catalytic Cracking (FCC)
- No catalysts, high pressure or hydrogen
- Gas and char used to run the facility and dry the biomass (energy self-sufficient)
- 35 patents issued, 97 pending
A 30+ Year Growth Story Backed by Commercial Operations

1984

1989
Commercial Deployment

1998-2005
Heavy Oil

2006
Ontario Facility & return to Bio-energy

Ongoing Bioenergy Expansion
Strategic Relationships Across the Value Chain

Feedstock

Conversion to RFO

Refinery Feedstocks

Heating & Cooling

Specialty Chemicals & Food Ingredients

Fibria

Honeywell UOP

Honeywell UOP

Sprague

Red Arrow

ARBEC

Envergent

Chevron Technology Ventures

CleaverBrooks

KERRY

Roseburg

A Forest Products Company

Tesoro

PETROBRAS
Ensyn’s Strong Investor Base

Credit Suisse

Fibria

investeco

Roseburg

IMPAX

Chevron Technology Ventures
Initial Commercialization – Specialty Chemicals

- Initial commercial application – specialty chemicals & heating fuels
- 25+ years of commercial production
- Over 40 million gallons produced
- Five commercial RTP facilities in operation
- Strategic relationship: Kerry Group (Red Arrow Products, Wisconsin)
- Over 30 food products developed
- Kerry is the market leader
Industrial Chemicals Under Development

- Resins
- Phenol Replacement in wood resins
- Concrete additives/emulsifiers
- At least 20 industrial (non-food) chemicals of interest
Fuel Oil

- Over 25 years of combustion on an industrial scale
- Approximately 20 million gallons used in industrial boilers
- Now demonstrated across a range of applications
  - Heating & cooling markets
  - Large commercial and institutional users
  - District heating systems
  - Mining operations
Heating Sales & Contracts

- Memorial Hospital, New Hampshire
  - 100% conversion to RFO for almost 2 years
  - Generating D-7 RINs

- Youngstown, Ohio District Heating
  - Commercial deliveries have begun

- Bates College

- Additional contracts under negotiation with major district heating companies

- Strategic Alliances with Infrastructure & heating oil suppliers
Refinery Co-processing vs. Traditional Biofuels

Leveraging existing infrastructure:

- Lowers the refiners CAPEX & OPEX of compliance
- Facilitates implementation
- Up to 5% biocrude processed with conventional petroleum feedstocks
- Provides comparable yields on a volumetric basis
- Does not compete for market share with the refiner
- Allows refiner to control generation of their regulatory credits
Co-processing Deployment

- 5+ years of development, including refinery trials
- Strategic alliance with Honeywell UOP expanded in 2014 to include Refinery Co-processing
- In negotiations with a motivated group of “Early Adopter” refiners
- Refiner strategic relationships include Chevron & Tesoro
- Several additional refiner initiatives underway
- Biocrude supply for these contracts:
  - Initially from the Ontario facility
  - Additional deliveries from projects in development
Production Facilities & Projects
Ontario Production Facility

- 3 million gallons per year in addition to approx. 3 million gpy in Wisconsin
- Commissioned in 2006 as a merchant plant for chemicals and fuels production
- Enhanced in 2014 as Ensyn’s anchor fuels facility
- Facility is qualified by the U.S. EPA under the RFS program
- Sales to qualified users in the U.S. are generating D-7 RINs
Cote Nord Project, Quebec

- 10 million gallon per year facility being developed by Ensyn and Arbec Forest Products
- First of several projects contemplated by the partners under their JDA
- Located at Arbec’s sawmill facility in Port Cartier, Quebec
- Feedstock for the project is local forest residues
- Product will be sold to heating and refining customers in the U.S. Northeast
- Project funded, civil work has begun and major equipment modules ordered
Aracruz Project - Brazil

- 20 million gallon per year facility being developed in partnership with Fibria Celulose
- Located at Fibria’s pulp mill in Aracruz, Espirito Santo
- Feedstock is eucalyptus forest residues
- Offtake targeted for U.S. refineries and heating clients
- Preliminary engineering substantially complete
Vienna Project, Georgia

- 20 million gallon per year facility being developed by Ensyn, Renova Capital Partners, and Roseburg Forest Products
- Location is a mothballed mill in Dooly County, Georgia
- Feedstock is forest residues and thinnings from local sources
- Product targeted for refineries and district heating clients
- Conditional commitment from the USDA for a $70 million loan guarantee with Citibank as the Lender of Record
- Preliminary engineering substantially complete
Thank you!