Sustainable Agriculture
Sustainable Agriculture

Poultry

Pork
Sustainable Agriculture

Beef

Dairy
Sustainable Agriculture

Aquaculture

Potable
Sustainable Agriculture

Octane

Clean Air

Renewable
Sustainable Agriculture

Boards
Sustainable Business
Line of Sight Advancements
Presented by: Jeff Scharping
Ethanol from Field to Car
NEW DIVERSIFIED REVENUE STREAMS

- More Ethanol
- DDGS
- More Corn Oil

- High Protein Distillers
- Fiber + Syrup
- Proteins
- Cellulosic D3 Rins
- Carbon Credits
- Gasifier – Reduce Inputs

Integrated Operational Improvements Across the Plant

Make More Gallons, Better
Changing Markets

![Meat Consumption Graph]

- Sheep/Goats
- Beef
- Pork
- Wild Fish
- Farmed Fish
- Poultry
Right Sizing for Separation
Better Conversion
10% More Corn Oil
Helps Hammermills
Screen Enhancements
Screen Separation
Roller Mill Upgrade

Flake vs Tear
Every Particle Touched 2x
Much Lower Electrical Load
10% Capacity Increase
10% More Corn Oil
Operational Improvements
5% Energy Reduction in Drying
Fiber Separation

Starch
Endosperm

Hull and Fiber

Germ

Starch and Gluten
Endosperm
Fournier Press – Fiber Dewater
• Improved Evaporator Management
• Backset Solids Removal
• Increased syrup solids
• Reduced water to dryers
• Protein in Higher Value Form

Removes 50% Suspended Solids
Greenville, OH Installation
Evaporator Enhancements

• Reduced Plating
• Increased Heat Transfer
• Reduced Chemicals
• CIP Less
• Less Shutdown Cleaning
• Increased Capacity
10% Yield Increase
3.1 Gallons/Bu
1.2+ Pound Corn Oil
D3 Rins and Carbon Credits
Higher Protein DDG
Integrated Fermentations

- Integrated Capital
- Same Corn Feedstock
- Increases Standard Yields
- Same Chemical Usage
- Same Water Usage

Normal 1G Ferm

32-35% TS mash → 13-15% EtOH

HHF + ICF 1.5G Ferms

40% TS mash → 17% TS → 5% EtOH → 13-15% EtOH
ELEMENT – New Generation

- 70 mmgy
- 10% Cellulosic
- Fully Integrated Tech
- Additional R&D phases
- 3.1+ gallons/bu
- 70% off the grid Gasification
- Carbon index 10 and 55
- Lowest Cost per Gallon
NEW DIVERSIFIED REVENUE STREAMS

++Ethanol

High Protein Distillers

Fiber + Syrup

DDGS

Proteins

++Corn Oil

Cellulosic D3 Rins

Carbon Credits
Gasifier – Reduce Inputs

++Ethanol

Ethanol

DDGS

Proteins

++Corn Oil

Corn Oil

Carbon Credits

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Ethanol from Field to Car
A Bright Future!

Primary Emissions

- Environmental Science and Technology 2013
Thank You!

Jeff Scharping
Director of Sales
ICM – Colwich, KS
Phone: 316.977.6833
jeff.scharping@icminc.com

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