the energy of innovation™

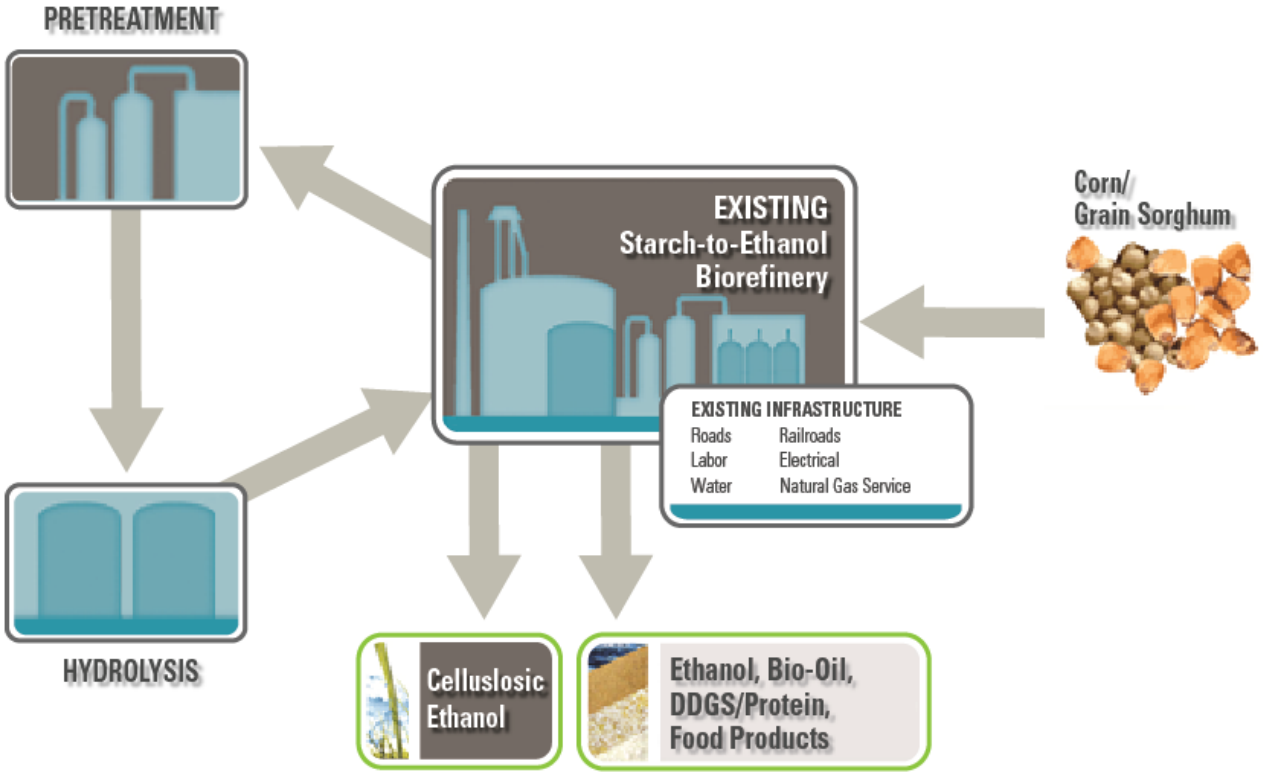
March 20, 2014

Feedstock Pathway Approval Process

Douglas B. Rivers, Ph.D.
ICM, Inc.
Director, R&D
Direct Line: 316.977.8502

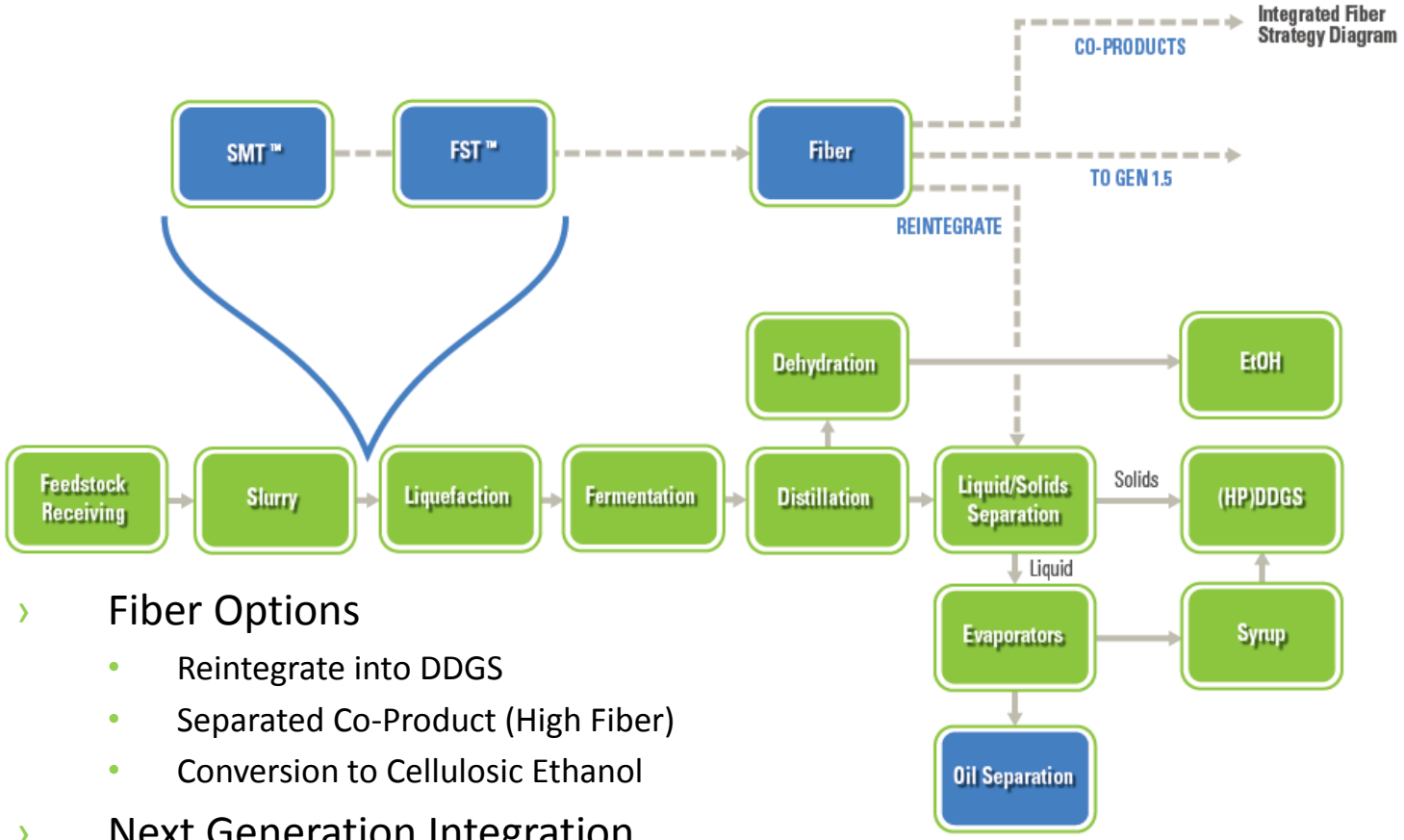
Generation 1.5: Grain Fiber to Cellulosic Ethanol Technology

Integrated Cellulose at Existing Facilities



the energy of innovation™

Fiber Stream Options

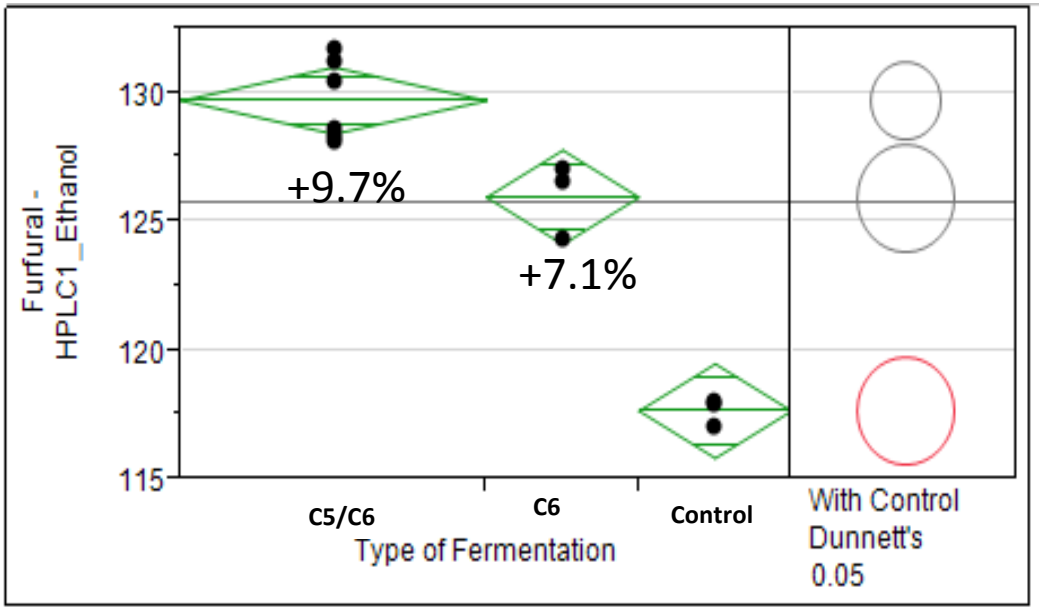


- Fiber Options
  - Reintegrate into DDGS
  - Separated Co-Product (High Fiber)
  - Conversion to Cellulosic Ethanol
- Next Generation Integration

Generation 1.5: 1000-Hour Dry Frac Process

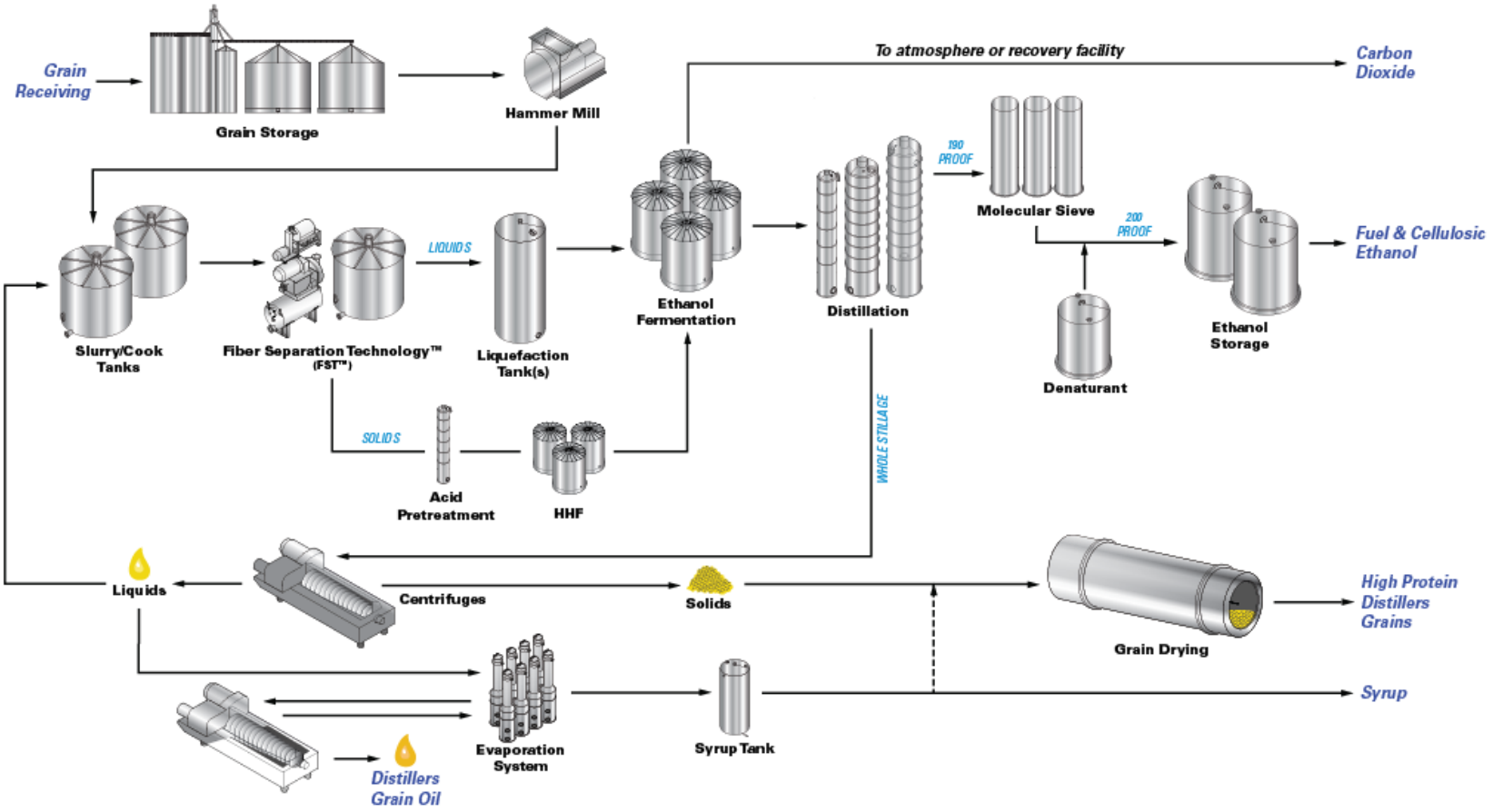
Integrated Run Overview

- 24 x 10,000 gallon starch/cellulose integrated pilot fermenters
- 18 x 35,000 gallon hydrolyzate tanks
- 5 x 535,000 gallon full-scale test fermenters
- 5 x 535,000 gallon full-scale control fermenters
- 1200 hours of pretreatment run time



the energy of innovation™

Gen 1.5 Ethanol with FST™



the energy of innovation™

Proposed Rule on Corn Kernel Fiber

- Request for Comments
- Discussion with Industry Stakeholders
- Comments
  - Detailed
  - Focused on EPA Requests
  - Ability to Implement
- Follow-Up Phone Discussion

Thank You!

Douglas B. Rivers, Ph.D.

2811 S. 11th Street, Ste 100

St. Joseph, MO 64503

Phone: 316.977.8502

Helpful websites:

ICM – icminc.com

Growth Energy – growthenergy.com

Urban Air Initiative – urbanairinitiative.com

Ethanol – drivingethanol.org

the energy of innovation™