UP Franchise – Tremendous Opportunities

UP at a Glance

- Miles of Track: 32,300 in 23 States
- Employees: 49,000+
- Customers: 25,000
- Locomotives: 8,700+
- Freight Cars: 94,000+
Ethanol Demand Drivers

- RFS Mandate
  - Political
- MTBE
  - Ban
  - Liability
- Extend Gasoline Stocks
  - Economics
  - Limited Refining Capacity
- Octane Efficiency

U.S. Ethanol Production Capacity

Source: USDA
Ethanol Production and Demand Markets

Production

2008

- CA 21%
- South East 24%
- TX 9%
- North East 33%
- Other 21%

2015

- CA 21%
- South East 17%
- TX 8%
- North East 22%
- Other 32%

Demand

Source: UPRR Estimate using various data sources
US Ethanol Biorefinery Locations

Source: Renewable Fuels Association
Key Ethanol Consumptive Markets

Million Gallons Per Year – E10 Demand

Northeast States Demand Grouped together

Source: DOE/ EIA
Ethanol Supplied by Rail

Rail Share of Total Ethanol Demand by Region

Highlighted Area Represents Rail Share

Source: UPRR Estimate using various data sources
DDGS Supplied by Rail

Rail Share of Total DDGS Demand by Region

Source: UPRR Estimate using various data sources
Ethanol & DDGS Impact on US Rail Volume
2003 - 2007

Source: AAR Originated Carloads
Ethanol Supply Chain Components

- Production Plant
  - 55 MGY generates 5 cars each of ethanol and DDGS per day
  - Track infrastructure

- Tank Cars

- Rail Network
  - Manifest/Gathered-Combo/Unit
  - Terminal Yards/Line haul

- Unload Terminal
  - Unload System and Tank Storage

- Truck Rack
Ethanol Origin Terminal

Photos Courtesy of Poet Ethanol Products
Ethanol Manifest Pipeline
Ethanol Unit Train Pipeline
Truck Rack

Photo Courtesy of US Development
DDGS Destination Terminal

Photo Courtesy of Poet Nutrition
Potential Ethanol Supply Chain Constraints

- Rail Line Capacity
- Rail Terminal/ Yard Capacity
- Unit vs Manifest Shipments
- Terminal Unload Capacity
- Pipeline Management
- Tank Cars
- Storage Capacity
Future Corridor Volumes Compared to Current Corridor Capacity

2035 Without Improvements

Note: Volumes are for the 85th percentile day

Source: National Rail Freight Infrastructure Capacity and Investment Study by Cambridge Systematics, Inc.
**IA/MN Investment**

- **Active UP**
- **Under Construction**
- **Proposed Expansion**
- **Interchange**

- New siding at St. James
- Mankato yard buildout
- Upgrader Tracks connect Mason City Sub to Fairmont Sub
- Double Track through Mason City
- Add two more track on the Upgrader
- Iowa Falls expansion
- Ft. Dodge Bridge upgrade to 263K

- Construct a five track support yard off Elk Creek Siding
- Sioux City Yard Expansion
- Eagle Grove Yard Expansion
- Reconfigure Eagle Grove Diamond
- New siding and 3 track yard on the Tara Sub at Moorland
- Ft. Dodge Sub at Moorland
- Upgrader Tracks connect Mason City Sub to Fairmont Sub
- Double Track through Mason City
- Add two more track on the Upgrader
- Iowa Falls expansion
- Ft. Dodge Bridge upgrade to 263K
Unit Train Efficiencies

Efficiency Example Assumptions

- Using 2007 AAR Ethanol data
- 40% Reduction in Tank Cars if Volume Moved Via Unit Trains

Unit Train Efficiency

- 40%

Tank Cars

Manifest Service  Unit Train Service

0  5,000  10,000  15,000

0%  20%  40%  60%  80%  100%

2006 2008 2015

Manifest  Unit

- Unit vs Manifest Breakdown for US Ethanol Industry

Source: UPRR Estimate using various data sources
Estimated Unit Train Terminal Capacity

Maximum vs Current or Forecasted

Source: UPRR Estimate using various data sources
Estimated Ethanol Unit Shipments

Unit Train as a percent of total

Source: UPRR Estimate using various data sources
Estimated Unloading Capacity Utilized by Unit Train Demand

Source: UPRR Estimate using various data sources
## Constraints

<table>
<thead>
<tr>
<th>Constraint</th>
<th>2006</th>
<th>2008</th>
<th>2015</th>
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</thead>
<tbody>
<tr>
<td>Tank Cars</td>
<td>Red</td>
<td>Yellow</td>
<td>Green</td>
</tr>
<tr>
<td>Terminal Load out</td>
<td>Yellow</td>
<td>Green</td>
<td>Yellow</td>
</tr>
<tr>
<td>Unit vs Manifest Shipments</td>
<td>Red</td>
<td>Yellow</td>
<td>Green</td>
</tr>
<tr>
<td>Rail Terminal/ Yard Capacity</td>
<td>Green</td>
<td>Yellow</td>
<td>Red</td>
</tr>
<tr>
<td>Rail Line Capacity</td>
<td>Yellow</td>
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<td>Red</td>
</tr>
<tr>
<td>Terminal Unload Capacity</td>
<td>Red</td>
<td>Yellow</td>
<td>Green</td>
</tr>
<tr>
<td>Storage Capacity</td>
<td>Yellow</td>
<td>Green</td>
<td>Yellow</td>
</tr>
</tbody>
</table>

- **Red**: Constraint
- **Yellow**: Marginal
- **Green**: No Constraint