

Ethanol Project Development

Renewable Energy Development for Oklahoma Tribes

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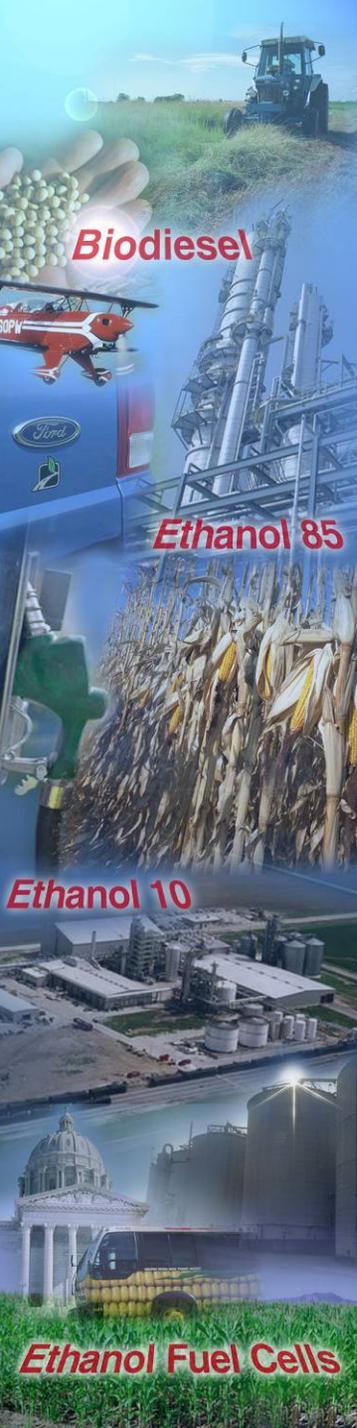
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Adding Value to the Biofuels Industry

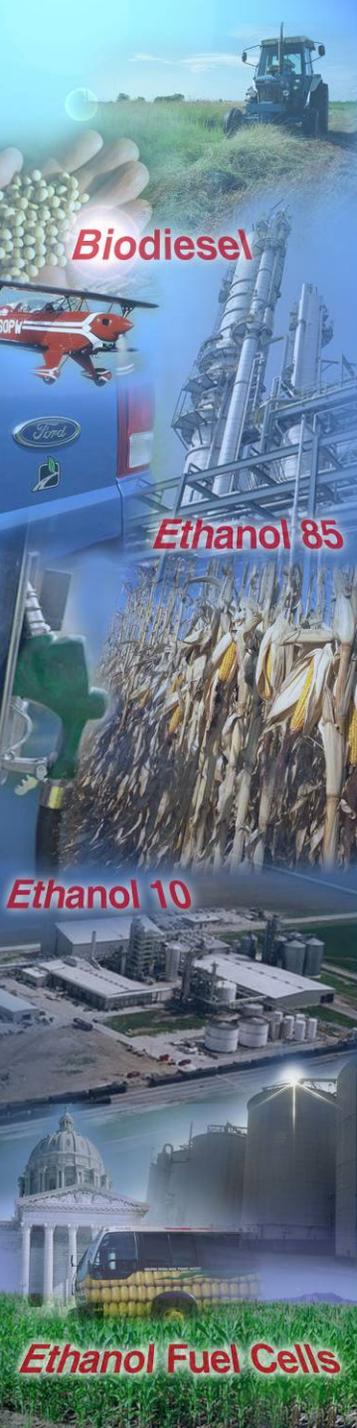
Presentation Overview

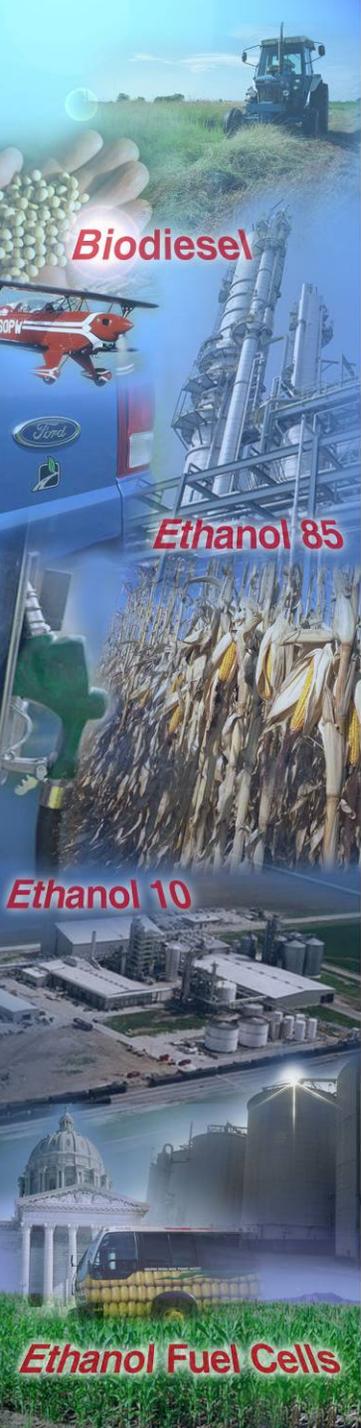
- Production/Process Technology
- Feasibility
- Overview on Project Development
- Economics of Financing and Production
- Lessons Learned
- Questions



Established Ethanol Production Processes

- Fermentation route
 - Conversion of starch in grains to sugar; yeast ferment the sugar to ethanol
 - Dry milling
 - Wet milling
 - Direct conversion (fermentation) of sugar to ethanol
- Catalytic conversion route
 - Hydroxylation of ethylene to ethanol
 - Industrial alcohol
 - Does not qualify for the federal excise tax exemption



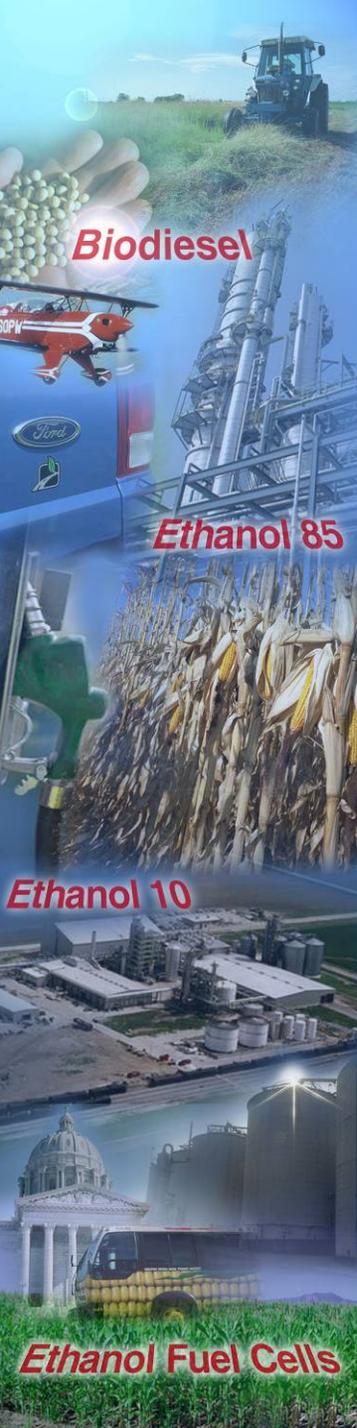


Ethanol Project Development

1. Initial meeting
2. Organization formed
3. Secure founder's money
4. Feasibility study
5. Develop Project Schedule and Seed Budget
6. Secure seed equity
7. Develop business plan
8. Design and EPC
8. Develop equity strategy
9. Equity drive
10. Off take and other agreements
11. Hire managers
12. Debt
13. Project construction
14. Begin operation

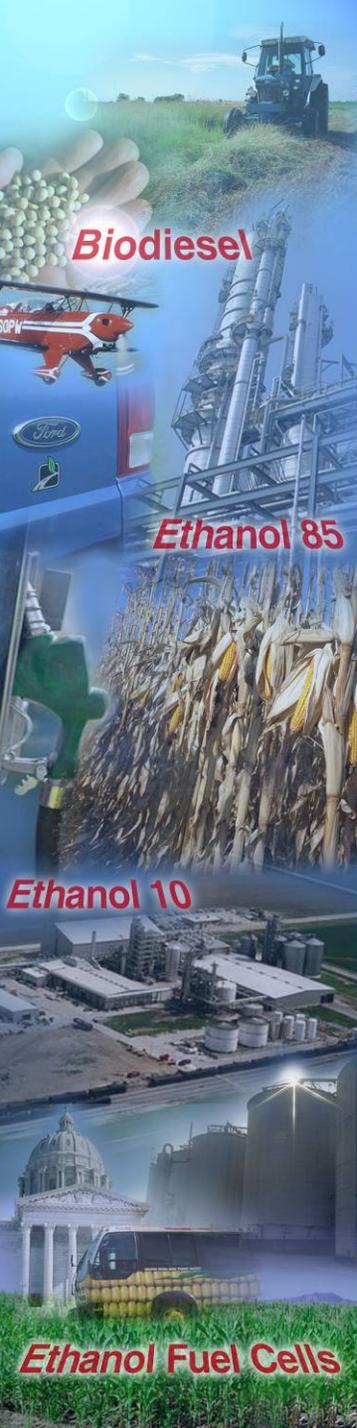
Key Elements of the Feasibility Study

- Site selection
- Feedstock analysis
- Market analysis
- Financial analysis
 - Construction costs
 - Owner's costs
 - Operating costs
 - Projected profitability and sensitivity studies



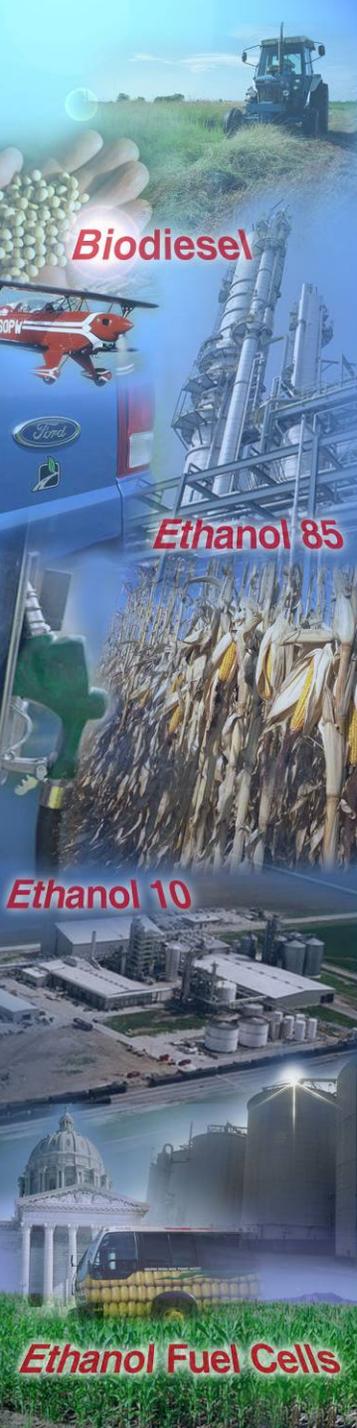
Feasibility Study Site Selection

- Typically 40 to 50 acres in a rural area with:
 - Low cost feedstock
 - Good rail access
 - Good road access
 - Adequate utilities at reasonable cost
 - Close proximity to co-product markets
 - Access to fuel markets
 - Access to labor



Feasibility Study Feedstock Analysis

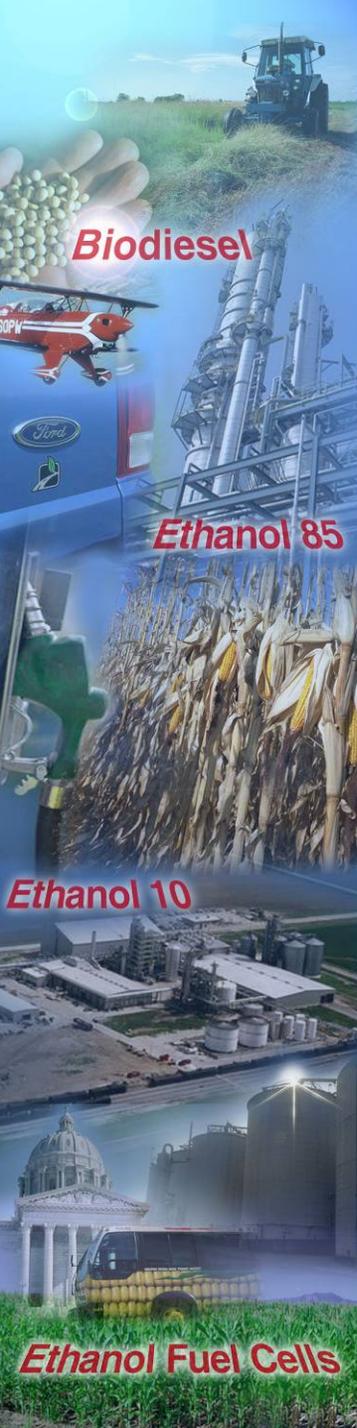
- Feedstock types
- Delivery radius for crops availability and price (10-yr history)
- Feedstock transportation
- Competition for feedstock



Feasibility Study

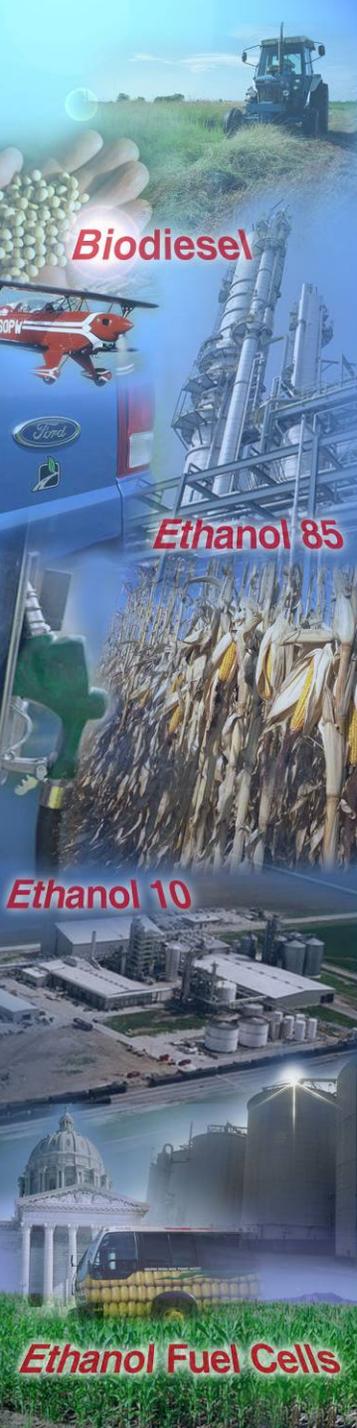
Product Market Analysis

- Define local, regional and national markets for the project's ethanol
- Document historical fuel use and price in the markets
- Estimate transportation costs to markets
- Need to establish value and potential market for co-products (Distillers Grains traditionally marketed to cattle feedlots and dairies; dry to poultry and swine)
- Carbon Dioxide – markets in major cities and in old oil fields



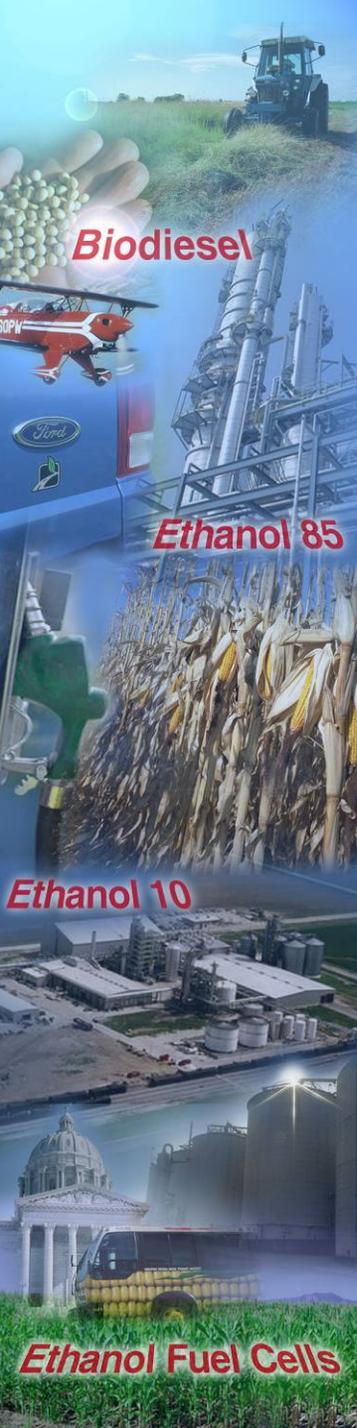
Feasibility Study Financial Analysis

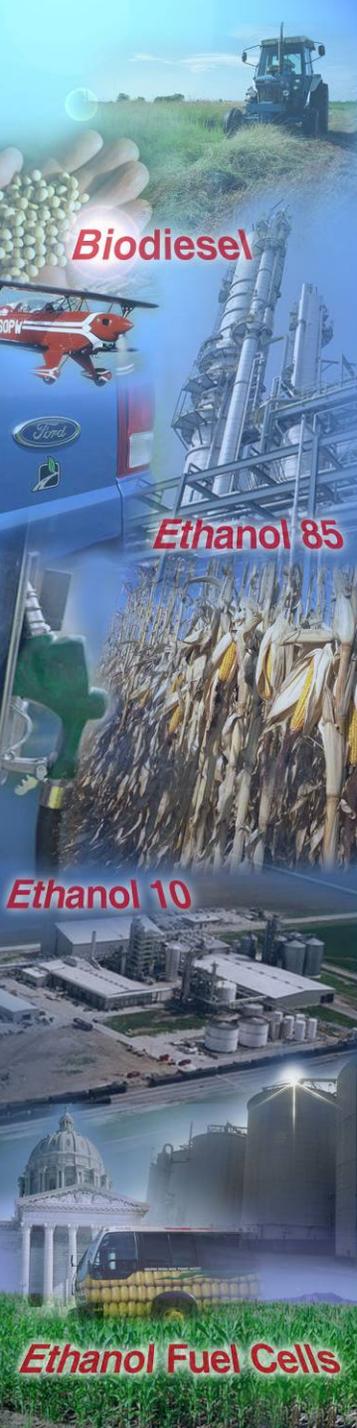
- Use conservative assumptions
- Use ROI or IRR to determine financial feasibility
- Biofuels Hurdle Rate --25% minimum ROI, 30% for better projects
- Returns are most sensitive to feedstock and fuel/energy pricing



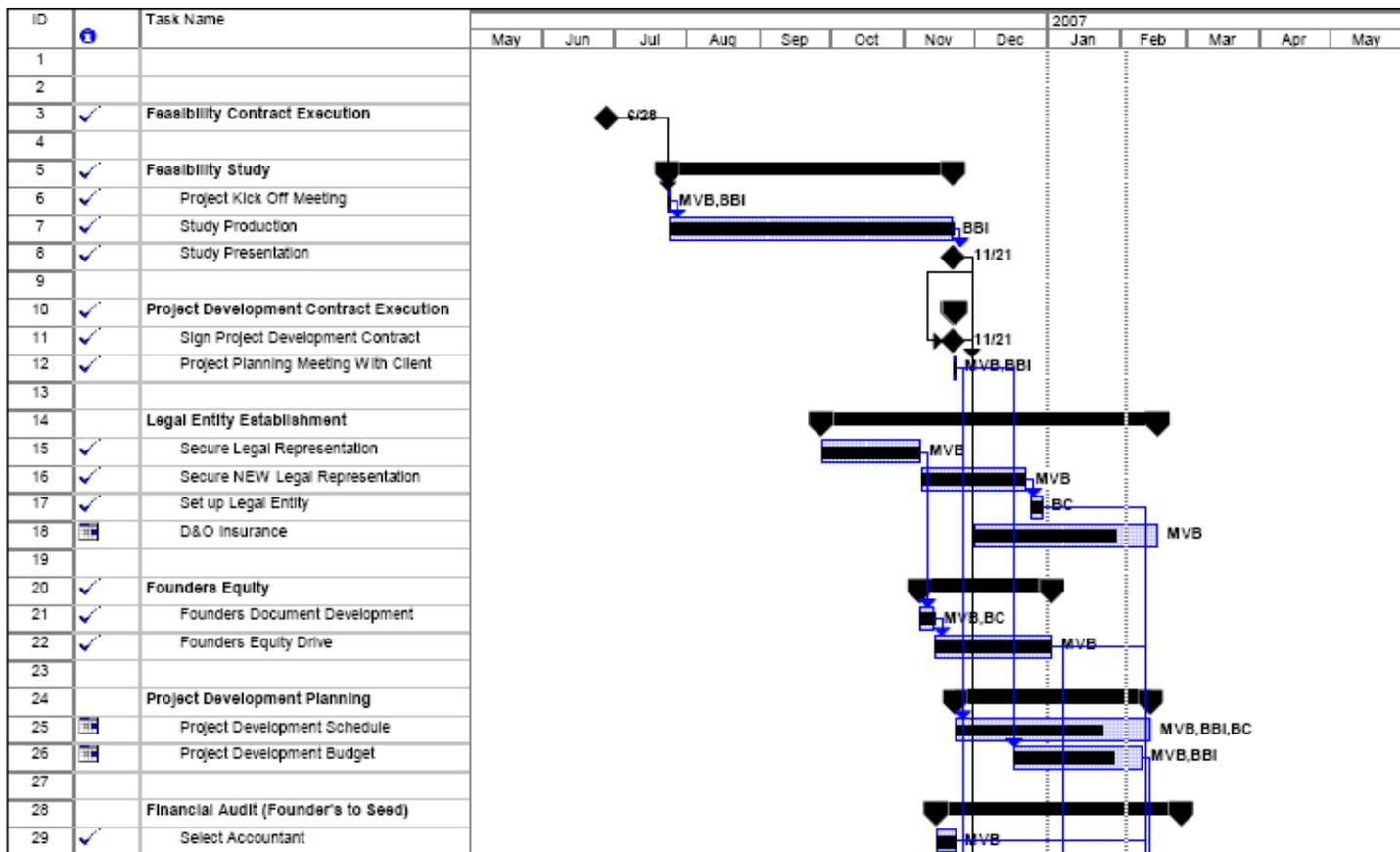
Project Schedule and Seed Budget

- Project Schedule
 - List of Task
 - Task Linkage
 - Resources
 - Critical Pathway
 - Tracking
- Project Budget
 - Seed Funding
 - List of Expenditures
 - Schedule of Expenditures

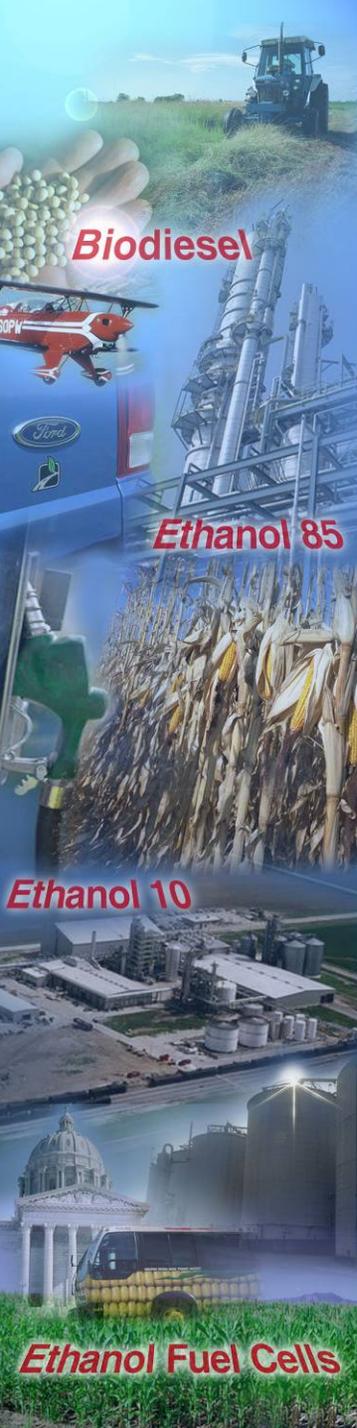




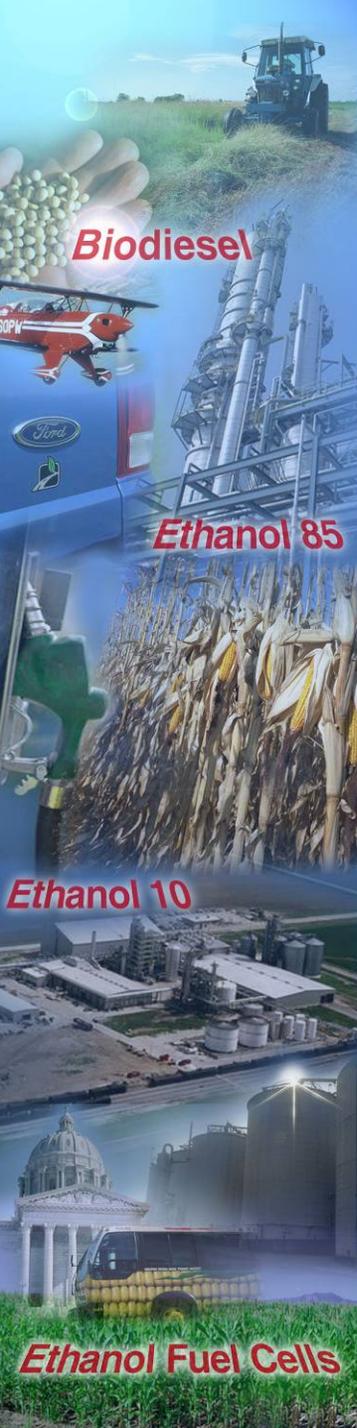
Schedule



Budget



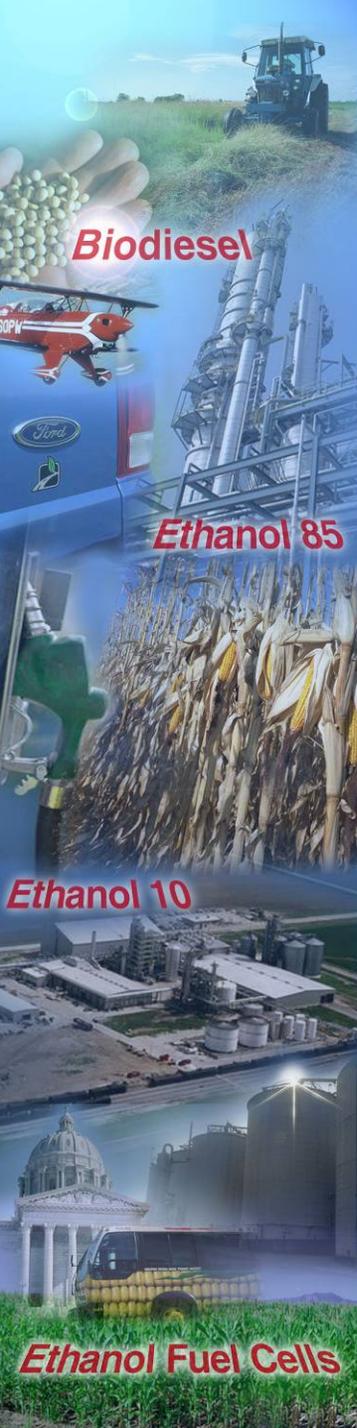
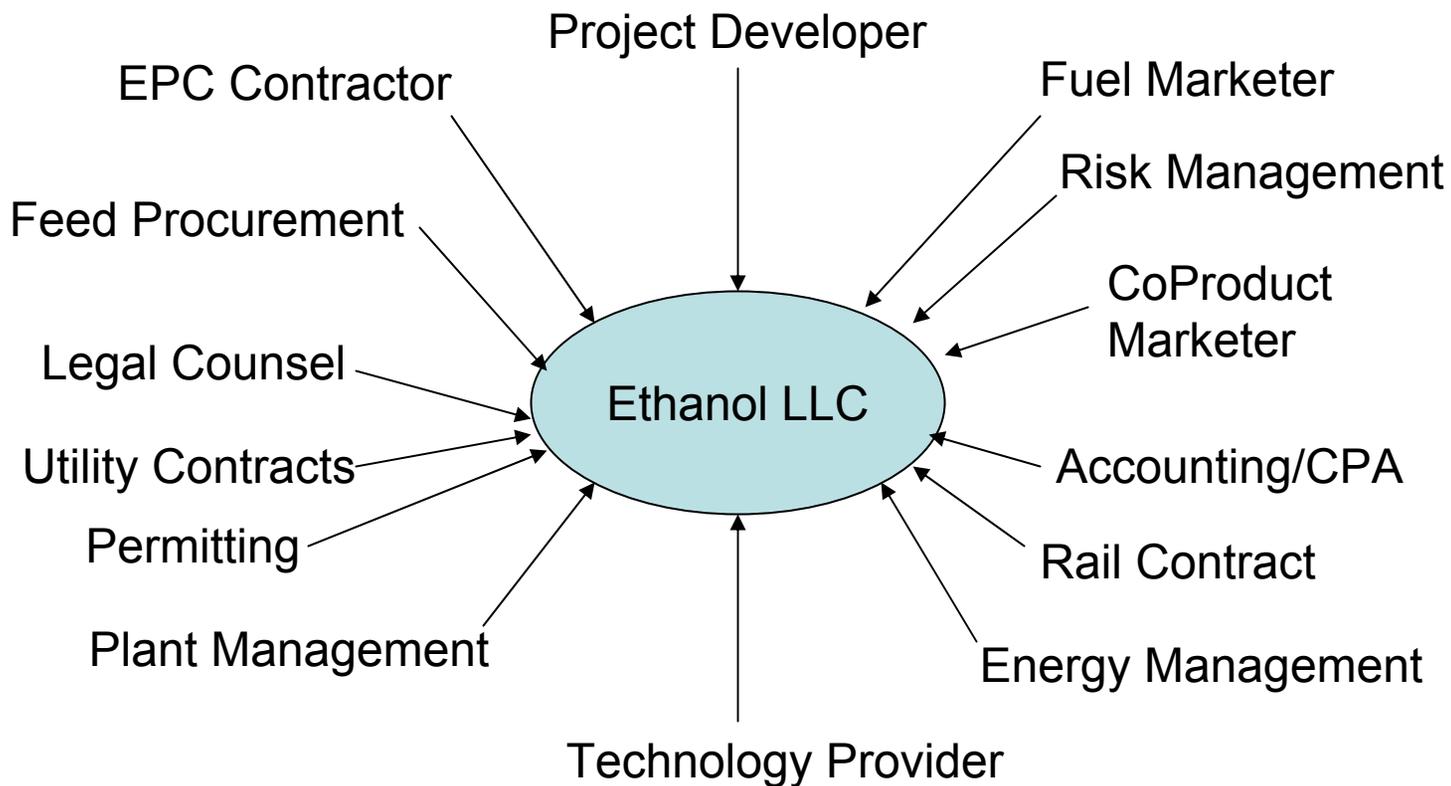
Seed Capital Budget			Date as of 02/01/07	
	Budget	Actual	Variance	
Startup funds (grant)	\$ -	\$ -	\$ -	\$ -
Grant	\$ -	\$ -	\$ -	\$ -
Founders	\$ 1,590,000.00	\$ -	\$ -	\$ 1,590,000.00
Seed Equity	\$ -	\$ -	\$ -	\$ -
Interest Accrued	\$ -	\$ -	\$ -	\$ -
Total Beginning Cash	\$ 1,590,000.00	\$ -	\$ -	\$ 1,590,000.00
<u>GENERAL PROJECT EXPENSES</u>				
Abstracts/Pre Land Title Expenses	\$ 1,000.00	\$ -	\$ -	\$ 1,000.00
Accounting	\$ 400,000.00	\$ -	\$ -	\$ 400,000.00
Attorney fees	\$ 600,000.00	\$ -	\$ -	\$ 600,000.00
BBI Fee and Expenses	\$ 160,000.00	\$ -	\$ -	\$ 160,000.00
Consulting	\$ 100,000.00	\$ -	\$ -	\$ 100,000.00
Dues and Subscription	\$ 1,000.00	\$ -	\$ -	\$ 1,000.00
General Business ***	\$ 150,000.00	\$ -	\$ -	\$ 150,000.00
Feasibility Study	\$ 40,000.00	\$ -	\$ -	\$ 40,000.00
Insurance	\$ 60,000.00	\$ -	\$ -	\$ 60,000.00
Office Supplies	\$ 10,000.00	\$ -	\$ -	\$ 10,000.00
Office Equipment	\$ 50,000.00	\$ -	\$ -	\$ 50,000.00
Travel	\$ 40,000.00	\$ -	\$ -	\$ 40,000.00
Postage	\$ 5,000.00	\$ -	\$ -	\$ 5,000.00
Printing	\$ 75,000.00	\$ -	\$ -	\$ 75,000.00
Office Rent	\$ 18,000.00	\$ -	\$ -	\$ 18,000.00
Administrative services	\$ 250,000.00	\$ -	\$ -	\$ 250,000.00
<u>SITE AND PRELIMINARY ENGINEERING EXPENSES</u>				
Process Engineering Package (LOI)	\$ 75,000.00	\$ -	\$ -	\$ 75,000.00
Level 1 Site Survey	\$ 5,000.00	\$ -	\$ -	\$ 5,000.00
Level 2 Site Survey (Optional)	\$ -	\$ -	\$ -	\$ -
Level 1 Geo-Tech Report (Max 5 to 7 boring across site)	\$ 10,000.00	\$ -	\$ -	\$ 10,000.00
Level 2 Geo-Tech Report (Optional)	\$ -	\$ -	\$ -	\$ -
Permit - Engineering	\$ 25,000.00	\$ -	\$ -	\$ 25,000.00
Railroad Spur Conceptual Design	\$ 7,500.00	\$ -	\$ -	\$ 7,500.00
Railroad Spur Preliminary Engineering (Optional)	\$ -	\$ -	\$ -	\$ -
Site Civil/Structural - Phase 1 Site Grading (Optional)	\$ 150,000.00	\$ -	\$ -	\$ 150,000.00
<u>REDUCE CONSTRUCTION TIME TASK (EXPENSES)</u>				
Preliminary Detail Design (Class 'A' Package design)	\$ 1,000,000.00	\$ -	\$ -	\$ 1,000,000.00
Cost Estimate from EPC	\$ 150,000.00	\$ -	\$ -	\$ 150,000.00
Detailed Engineering to Order Long Lead Time Items	\$ 1,300,000.00	\$ -	\$ -	\$ 1,300,000.00
Stainless Steel Plates for Tankage	\$ 5,000,000.00	\$ -	\$ -	\$ 5,000,000.00
Columns	\$ 3,000,000.00	\$ -	\$ -	\$ 3,000,000.00
Centrifuges	\$ 2,000,000.00	\$ -	\$ -	\$ 2,000,000.00
Dryers	\$ 5,000,000.00	\$ -	\$ -	\$ 5,000,000.00
Boilers	\$ 3,000,000.00	\$ -	\$ -	\$ 3,000,000.00
RTO	\$ 2,000,000.00	\$ -	\$ -	\$ 2,000,000.00
Chillers	\$ 1,000,000.00	\$ -	\$ -	\$ 1,000,000.00
<u>SITE DEVELOPMENT EXPENSES</u>				
Land Option	\$ 20,000.00	\$ -	\$ -	\$ 20,000.00
Preliminary Site Work (Optional)	\$ 5,000.00	\$ -	\$ -	\$ 5,000.00
Permit Fees	\$ 10,000.00	\$ -	\$ -	\$ 10,000.00
subtotal before Contingency			\$ 25,717,500.00	\$ 25,717,500.00
<u>PROJECT DEVELOPMENT CONTINGENCY</u>				
Contingency	\$ 2,571,750.00	\$ -	\$ -	\$ 2,571,750.00
Total	\$ 28,289,250.00	\$ -	\$ -	\$ 28,289,250.00



Business Plan

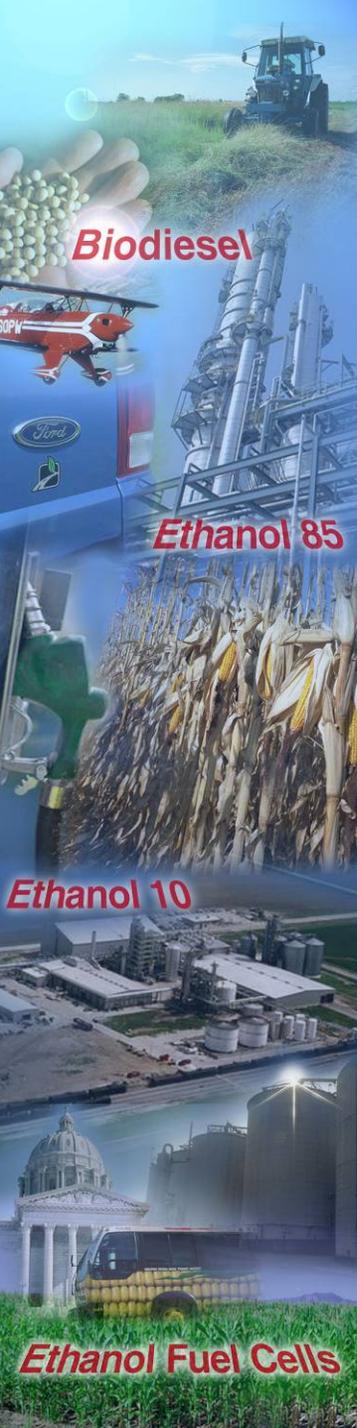
- Purpose
- Components
 - Project Description
 - Management Team
 - Products
 - Technology
 - Markets
 - Risk
 - Financials
- Living Document

Project Structure



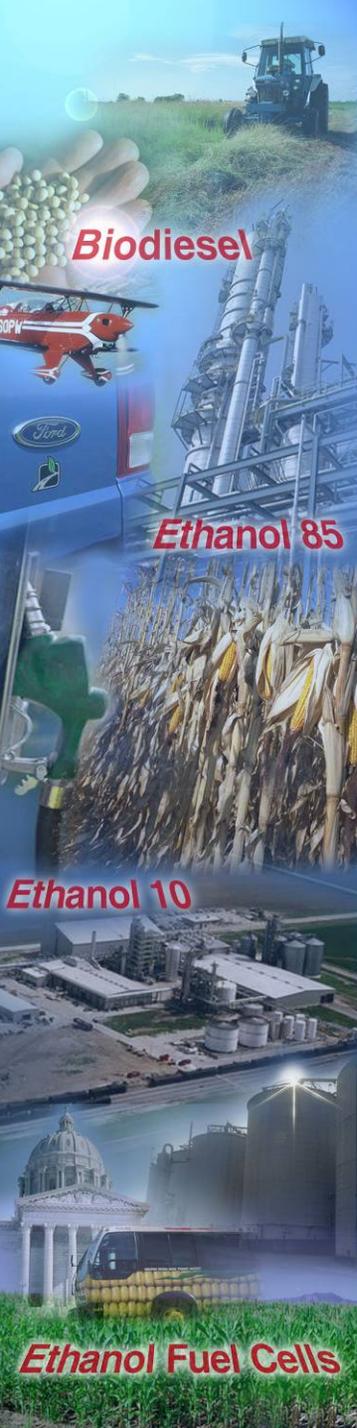
Design Companies and EPC

- Design Companies
 - Owners of Technology?
 - Engineering Services
 - Reputation
 - Schedule and Cost
- Engineering, Procurement, and Construction
 - Capabilities
 - Working Relationship with Design
 - Reputation
 - Schedule and Cost



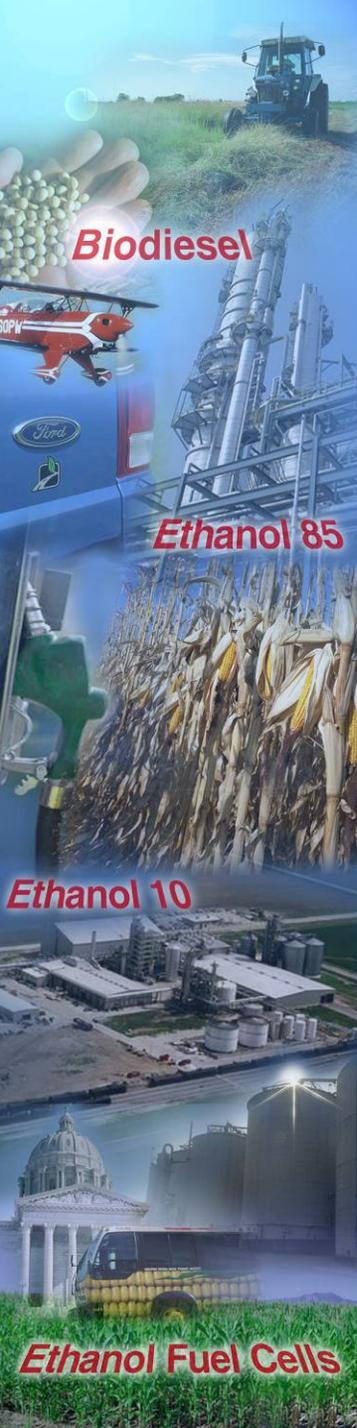
Other Service Providers

- Administration
 - Legal
 - Accounting
- Technical
 - Consultants and Management
 - Permitting
 - Engineering
 - Energy
- Input Agreements
 - Energy
 - Water
 - Feedstock
 - Risk Management
- Off Take Agreements
 - Major Product
 - CoProduct



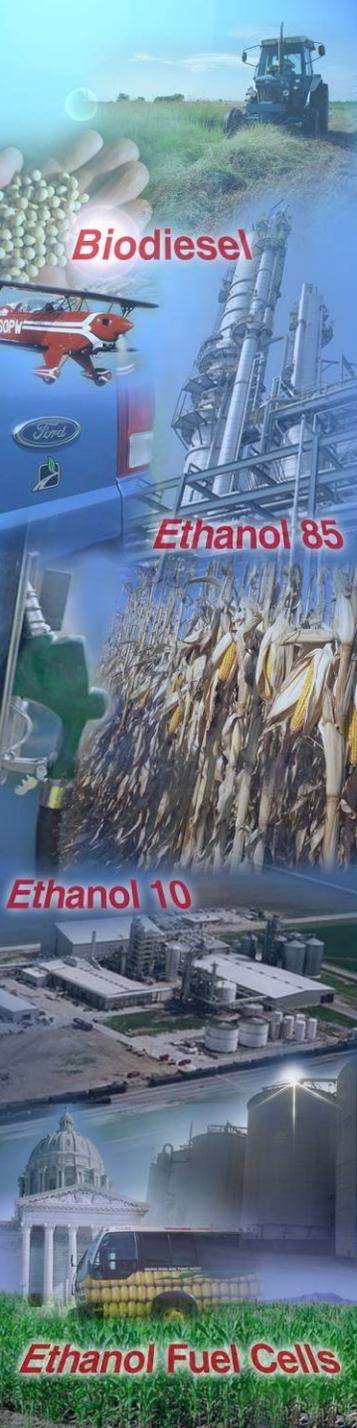
Project Equity Case Study - Ethanol

- Lenders require 50% equity
 - Increases debt coverage ratio, reduces lender's risk
- A 50 million gallon per year dry mill ethanol plant will cost approximately \$135 million
- Equity required is \$67.5 million
- Raising equity is typically the most difficult step for every project



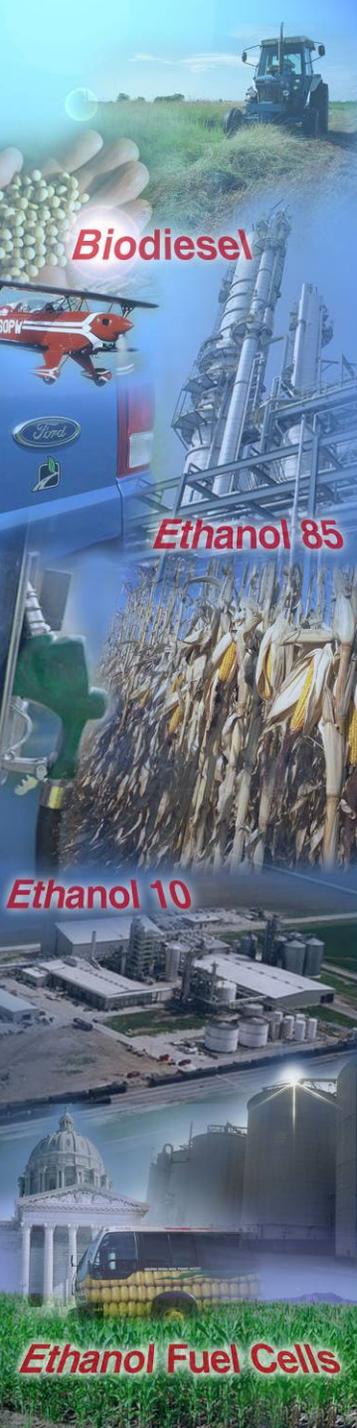
Equity Strategy

- Private Placement
 - Main Street
 - Wall Street
- SB2
- IPO
- Mezzanine or Sub-debt



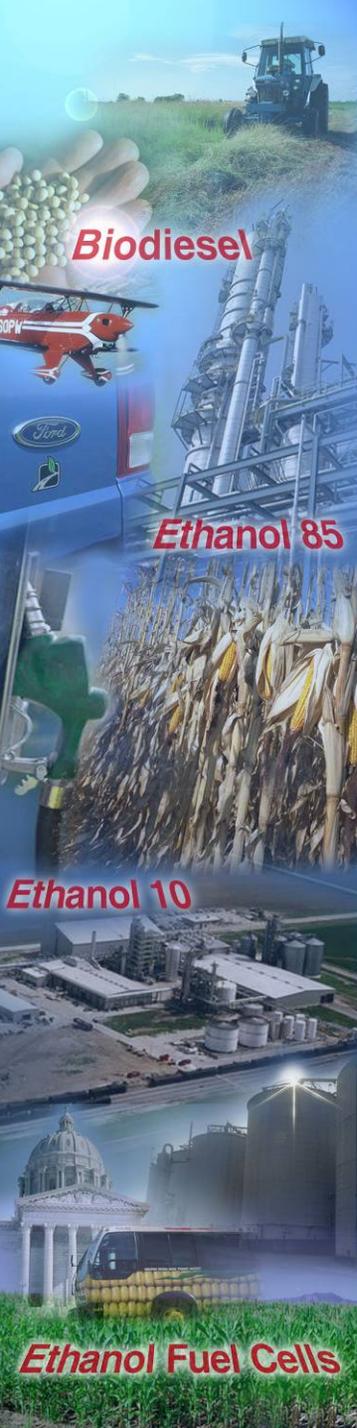
Demand for Capital

- In biofuels sector the ethanol and biodiesel industry have a strong demand on established sources of debt
- Business plans must be sound and complete with a strong risk management plan to attract capital
- Traditional sources of debt
- Non-traditional sources of debt



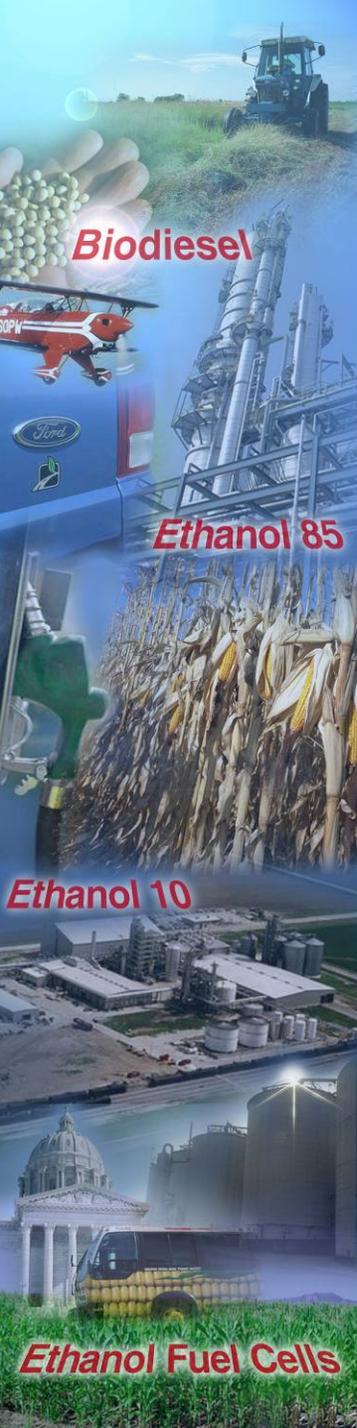
Commercialization Strategy

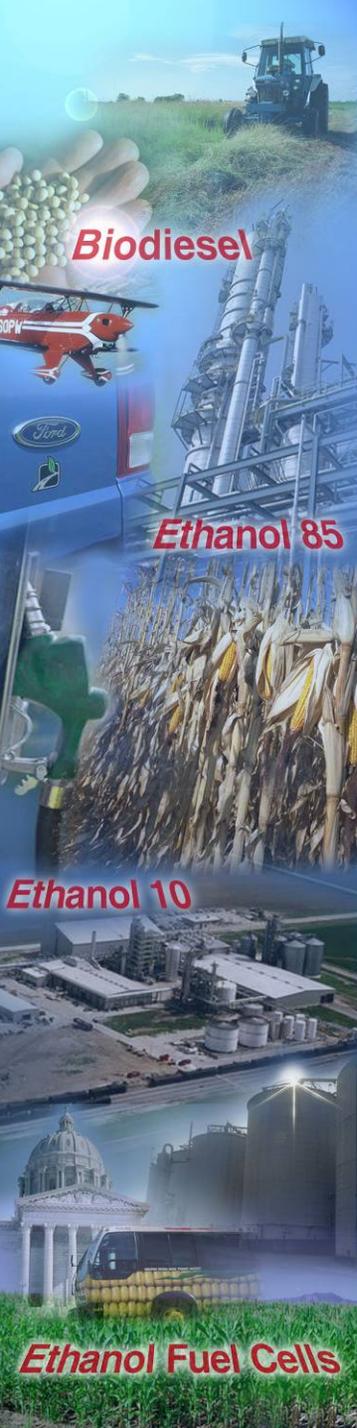
- Follow proven “model”
 - Site with adequate feedstock supply, utilities, transportation and markets
 - Utilize successful design/build firms
 - Secure feedstock supply
 - Hire experienced marketing firms
 - Assemble first rate management team
 - Raise most of the funds as equity
 - Projected Return on Equity should be 30% or higher



The Opportunity

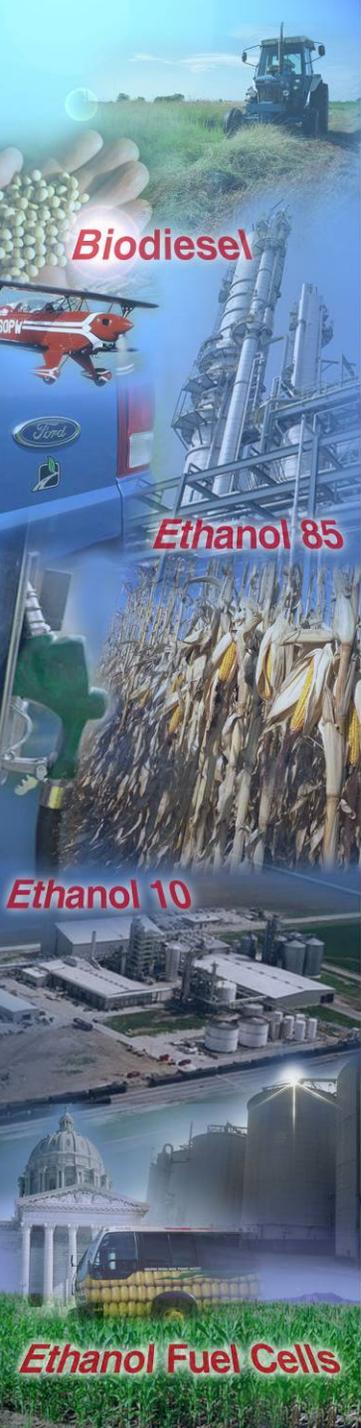
- Today's 7 billion gallons of annual ethanol production in the US is approximately 5% of the 140 billion gallon gasoline market
- A fully mature grain-to-ethanol market in the US could produce about 12-15 billion gallons
- If biofuels are ever to be a major component of America's gasoline pool, cellulose is a must





Conclusions

- Get Organized
- Do a feasibility study
- Plan
 - Schedule
 - Budget
 - Resources
 - Write a business plan
- Technology
- Construction
- Support Service
- Management
- Financing
 - Seed equity
 - Equity
 - Debt



Thank You



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