



Project Development in a Booming Ethanol Industry

Joint Forum on Biomass, Biofuels, and Bioproducts

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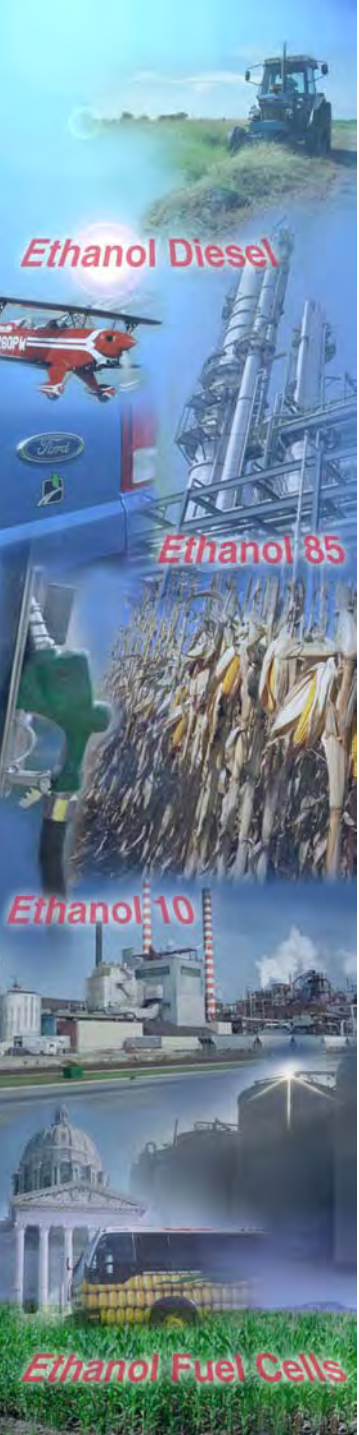
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Unprecedented Growth

- The U.S. ethanol industry is growing at an unprecedented rate:
 - 31 plants under construction with a combined capacity of 1.6 billion gallons
 - the plants being built today equal the entire industry output of just a few years ago
- U.S. ethanol use is about 4 billion gallons per year from 100 plants (3% of our gasoline pool)



Market Growth Drivers

- Phase out of MTBE
- Oxygenate for RFG
- Octane
- Gasoline extender
- Renewable
- Offsets oil imports
- High energy prices
- Renewable Fuels Standard



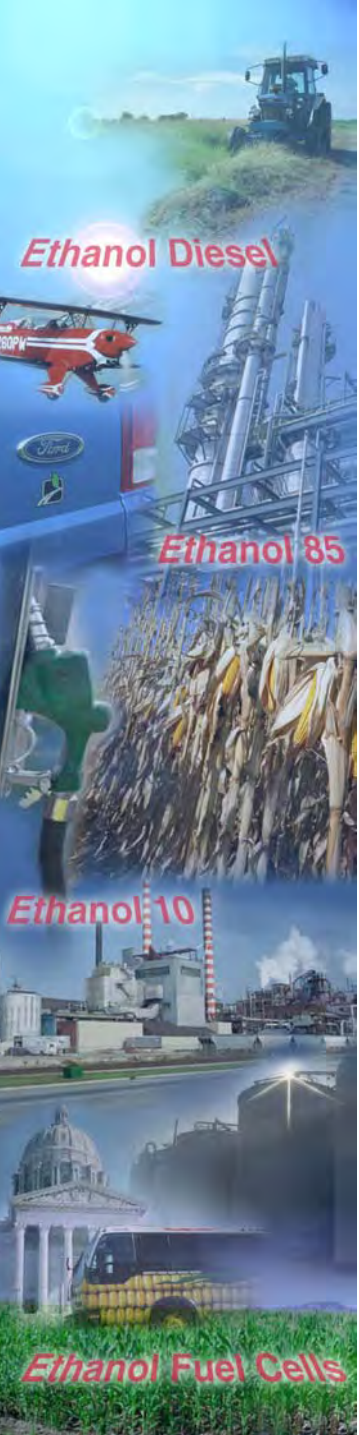
Siting Your Plant

- Corn Belt - Locate your plant where low cost corn is available and ship ethanol to the East and West Coast markets
- or –
- Destination Plant - Locate your plant near ethanol, distillers grain and CO₂ markets and rail in corn



Advantages/Disadvantages

- Corn Belt Site
 - Corn available locally/lower cost
 - Ship ethanol and DDGS to local, regional and national markets
 - Probably won't sell CO₂
- Destination Site
 - Higher cost corn from multiple sources
 - Lower ethanol shipping costs
 - May have market for CO₂
 - Avoid shipping in corn and shipping out products



Destination Sites

- The best destination sites will have:
 - Large local ethanol market (< 150 miles)
 - A wet distillers market (dairies or feedlots within about 100 miles)
 - A large local dry distillers market
 - A CO₂ market
 - Source of low cost energy
 - Steam from an existing power plant
 - Coal or biomass fueled boiler
 - Natural gas transmission line
 - Unit train grain delivery capability



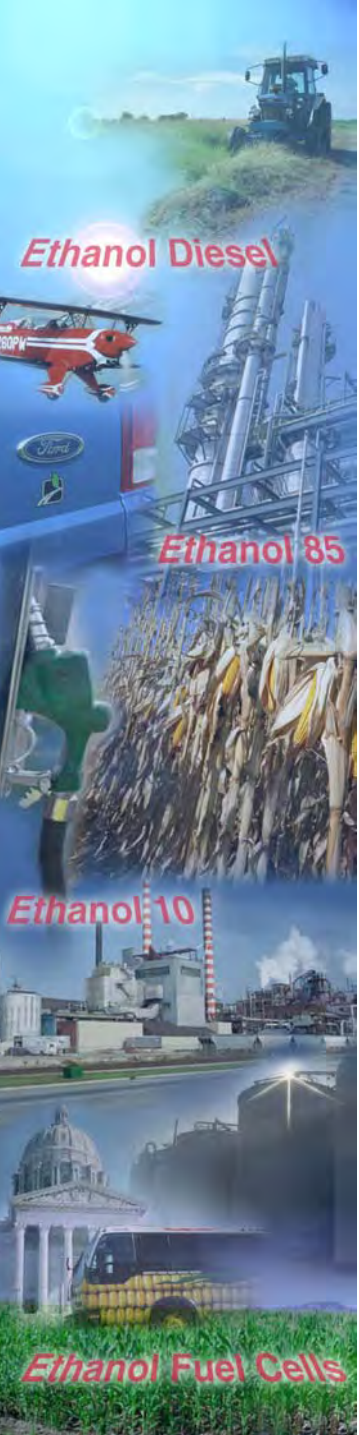
Project Development Step 1

- Site Selection
 - Access to feedstock
 - Access to markets
 - Energy (usually natural gas)
 - Rail
 - Utilities (electricity, water, wastewater)
 - Labor
 - Community acceptance/support



Project Development Step 2

- Feasibility Study
 - Evaluate sites
 - Feedstock analysis
 - Ethanol market analysis
 - DDGS and CO2 market analysis
 - Capital and operating cost estimates
 - Financial analysis
 - Sensitivity studies
 - Competitive analysis
 - Recommendation – go/no go



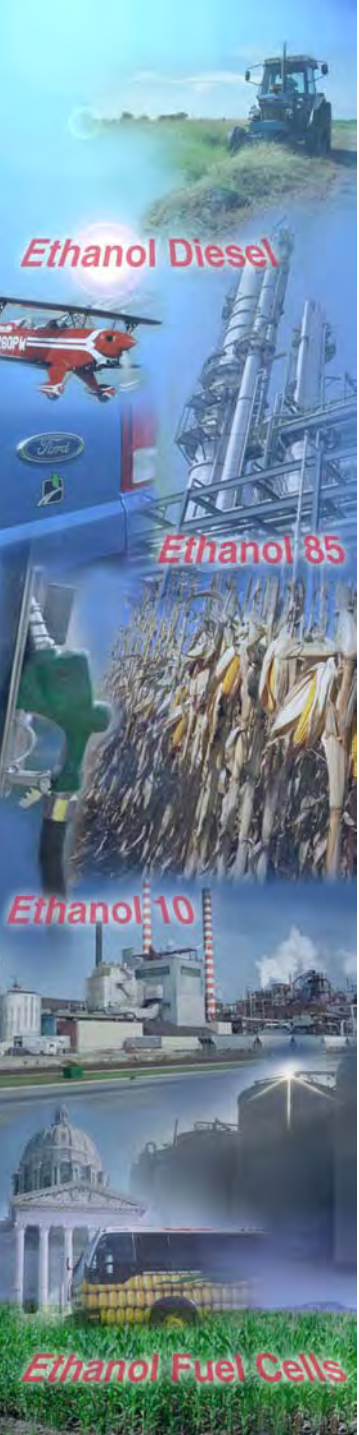
Project Development Step 3

- Develop project plan
 - Business formation
 - Management plan
 - Write business plan
 - Develop financial plan



Project Development Step 4

- Implement project plan
 - Raise seed equity
 - Select site
 - Select design/builder
 - Apply for air permit
 - Raise balance of equity
 - Negotiate contracts for natural gas, electricity, water, rail, grain supply, etc.
 - Obtain debt financing
 - Financial close/start construction



Project Development Step 5

- Construction and startup
 - Hire construction manager
 - Hire GM and plant manager
 - Hire and train staff
 - Startup
 - Performance test



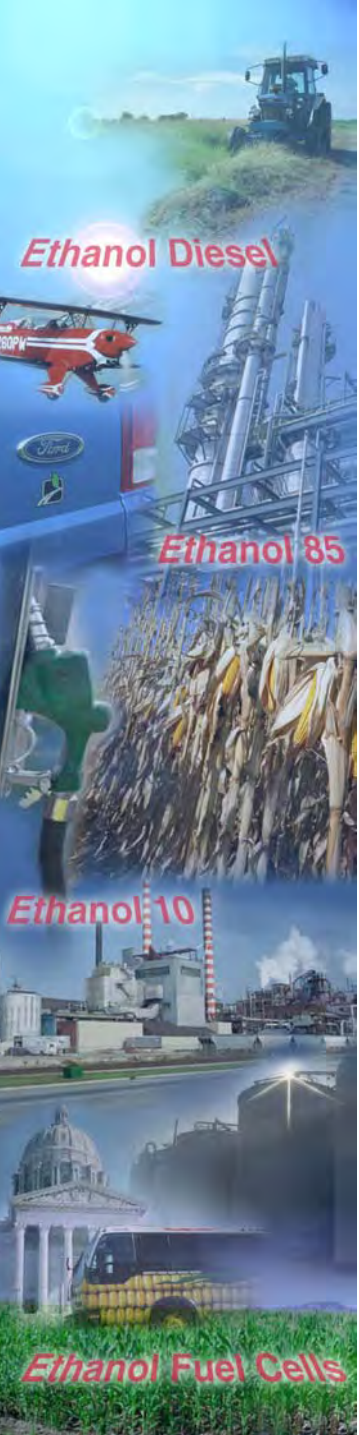
Project Development Tips

- Keep your focus on developing a “financable” project
- One that lenders and investors alike will find attractive and worthy of investment
- Avoid unproven, non-commercial technologies
- Set your project apart from the dozens of others vying for investment and debt capital



Gaining an Advantage

- Low feedstock cost
- Proximity to ethanol markets (lower shipping costs)
- Low energy costs
- Large wet distillers grain market
- Tax abatements and economic development programs
- Local CO₂ market



Example

- 50 mmgy dry-mill ethanol plant with corn feedstock
- \$2.30 per bushel corn price
- \$1.40 per gallon net ethanol income
- \$8.00 per million Btus for thermal energy
- \$80 million capital cost
- 40% (\$32 million) equity/ 60% debt

Impact of “Advantages”

	Annual Pre-Tax Income	Return on Investment
Typical plant with no “advantage”	\$9,998,282	31 percent
Selling all distillers wet grains	\$14,003,807	44 percent
\$2.00/MMBtu lower energy cost	\$13,518,282	42 percent
20 cents-per-bushel lower grain price	\$12,596,674	39 percent
4 cents-per-gallon higher ethanol income	\$12,195,869	38 percent





Summary

- Consider all issues when siting your project:
 - Delivered corn price
 - Ethanol shipping costs
 - Wet and dry distillers markets
 - Energy costs
 - CO2 market
 - Community acceptance



Thank You!



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