

Frazier, Barnes & Associates, LLC



Since 1996, Frazier, Barnes & Associates has been a leading provider of technical and management consulting services to the agricultural industry.

FBA specializes in the development and analysis of grain and oilseed processing projects and 1st and 2nd generation bioenergy projects.

Renewable Fuels and Agribusiness Consulting

FOOD/FEED/AGRIBUSINESS/RENEWABLE FUELS



Frazier, Barnes & Associates, LLC

901-725-7258

7777 Walnut Grove Road

Suite A5, Box 24

Memphis, Tennessee 38120

Frazier, Barnes & Associates, LLC (FBA) is a Technical and Marketing Consulting services firm formed in 1996 to provide a broad range of services to Agribusiness and the renewable fuel industries. The firm's project expertise ranges from feasibility analysis and business plans to project development, engineering and construction oversight.

Extreme market volatility has brought opportunities and, more recently, challenges to project developers investors, and plant owners. FBA is uniquely positioned to bring insight and sustainable solutions through a wide offering of value-added services.

As an industry innovator in project and plant analysis, FBA offers four broad categories of services:

- **Technical and Operations Support**
- **Project Development and Commercialization**
- **Procurement and Marketing Support**
- **Management Oversight and Management Services**

FBA's commitment to its clients is demonstrated by the loyalty and expansion of its client base. Quality, accuracy and timeliness are hallmarks of FBA's client services. FBA's growing client family includes independent petroleum refiners, large corporations, lending institutions, commodity and trade associations, research institutions and state governmental groups, among others. Its close partner relationship with a vast array of clients gives FBA an expanding perspective on the growing needs of the agricultural industry as it shifts to an energy-driven market.

Located at the Agri-Center International in Memphis, Tennessee, FBA is uniquely positioned to assist its clients in the development of new and existing processing facilities and associated infrastructure.

In addition to marketing and engineering resources for 1st and 2nd generation projects, FBA can assist with feedstock procurement, product marketing and RFS2 Engineering Reviews. FBA is committed to being a reliable resource for bio-refineries and processors.

Frazier, Barnes & Associates

Business Services	Technical Services
Feasibility Studies	Independent Engineering
Business Plans	Technology Upgrades
Site Selection Analysis	RFS2 Reviews
Feedstock Assessment	Plant Expansions
Technology Evaluations	Start-up Services
Business Valuations/Appraisals	Operations Manuals
Operator Training Programs	Process Engineering
Plant M&A Due Diligence	Process Safety Management Programs

FRAZIER, BARNES & ASSOCIATES
Providing a Full Range of Value-Added Solutions

PROJECT DEVELOPMENT AND COMMERCIALIZATION

- Assessment of Processing Options
- Feasibility Studies
- Business Plans
- **Independent Reviews**
- Financial Closure
- Site Selection Analysis
- Project Engineering Services
- Construction Management/Owner's Rep Services
- Start-Up Planning and Implementation

TECHNICAL AND OPERATIONS SUPPORT

- Capital Project Audits and Evaluations for Biofuel Projects
- Start-up Assistance
- Oilseed Processing Solutions
- Operations Benchmarking Audits
- Operations Evaluations/ Plant Valuations
- Operator Training Programs
- **Third-Party Engineering Reviews**
- Technology Upgrades and Expansions

MANAGEMENT AND MARKETING SUPPORT

- **Feedstock Procurement Plans**
- Product and Co-Product Marketing Support
- Marketing Plan Development
- Plant Management Services
- Product Off-take Agreements
- Quality Assurance, ISO 9000 and BQ 9000 Development
- **Strategic Planning**

RESEARCH AND DEVELOPMENT

- Processing Plant Product Quality Research Studies
- Leading Edge Processing Technology Research and Development
- Pilot Plant Technology Development
- Alternative Feedstock and By-product Research

RELEVANT PROJECT EXPERIENCE:

FBA has conducted numerous appraisals, feasibility studies, business plans, technical reviews and audits for the biofuels & agricultural processing industries. In addition, FBA provides project development services for a broad customer base and has been involved in the development of a significant amount of process capacity.

Following is a sample of the consulting projects we have worked on in the past.

BIOMASS

Pyrolysis Technology Evaluation

Evaluated numerous pyrolysis technology options in various stages of development. Recommended the lowest risk investment to the client.

Biomass Education Project

Worked in conjunction with AgroTech Communications to develop a biomass education program that identified potential biomass feedstocks to be utilized in Tennessee. Made presentations across the state to potential biomass project developers.

Anaerobic Digestion By-Products Study

Feasibility of anaerobic digestion of acid whey and yogurt into biogas and digestate.

Anaerobic Digestion of Swine Waste

Feasibility of locating an anaerobic digestion facility in north-central Iowa to process swine waste from the estimated 80,000 feeder pigs in the region.

Cottonseed Oil Mill Biomass to Energy Project

FBA evaluated the feasibility of utilizing alternative energy sources for process steam generation at a cottonseed processing plant utilizing state-of-the-art boiler technology.

Agricultural By-Products Cogeneration Study

Conducted an evaluation determining the process and economics for converting soybean hulls and corn germ into thermal energy for an Iowa soybean processing plant.

Landfill Gas Utilization Project for an Existing Soybean Processing Facility in the Upper Midwest

Identified requirements for converting from natural gas to methane gas. Negotiated with the landfill owner and pipeline operator. Project resulted in significant energy savings for the processing plant.

Aggregation and Densification Study

FBA evaluated the biomass feedstock available in the procurement region of a planned pellet mill in WI. Evaluated the transportation and storage logistics for the agricultural and woody biomass. Contacted local farmers and co-ops for willingness to participate.

AGRICULTURAL PROCESSING & ENGINEERING

Corn Fractionation Study for the World's Leading Chemical Company

FBA evaluated the feasibility of fractionating high-starch corn and deoiling the germ component for edible oil or biodiesel use.

Employee and Management Training Program for a New Soybean processing Facility in Fairmont, Minnesota

Operations and safety training before and after startup of a large crushing facility for Cenex Harvest State's processing plant in Fairmont, Minnesota.

International Soybean Processing Technical Reviews

Conducted technical review of a soybean processing plant in Estonia. Conducted oilseed processing and edible oil refinery operational audit for plant in Australia.

Soybean Processing Internal Audits

Conducted multiple operational audits for numerous soybean processors. Developed a database to benchmark processing plant costs and efficiencies for internal use.

Soybean Processing Plant Modernization Project

Provided recommendations on necessary equipment modifications and the economics associated with recommended changes.

Edible Oil Refining Consultant Services

FBA has provided various technical services to edible oil refining operations.

Corn Oil Generation Conceptual Strategy for Leading U.S. Corn Oil Marketer

FBA provided technical and market consulting services for the front-end removal of corn oil from ethanol plants.

Grain Terminal Facility Asset Evaluations

FBA has conducted asset valuation reports on multiple grain handling facilities.

Bulk Fuel Terminal Feasibility Study

Conducted study determining the viability of constructing a bulk fuel river terminal in eastern Iowa.

Oilseed Processing Feasibility Studies & Business Plans

Conducted multiple feasibility studies and business plans for agricultural co-ops and soybean councils in the U.S. and Canada.

University of Illinois Soybean Processing and Meal Quality Study

FBA conducted a soybean processing Pilot Plant test for soybean meal and coordinated extensive soybean meal feeding trial tests utilizing soybean meal samples from multiple U.S. processing plants.

Tennessee Oilseed Diversification Business Development Plan

Developed a Business Plan/Conceptual Processing Model for a value-added oilseed processing facility to be located in West Tennessee. Project was conducted in collaboration with the Memphis Bioworks® Foundation and the Tennessee Department of Agriculture.

Cottonseed Oil Mill Business Valuation

FBA performed a due-diligence business and asset evaluation of an operational cottonseed processing facility.

Market and Financial Review for Montana Biofuel and Bio-lubricant project

Worked with producer group, University and Private Corporation to review their feasibility study and marketing plan. Developed a model for conversion of wheat acres into canola/mustard seed acres.

BIODIESEL

Project Engineering for Upgrade to 12 Million Gallon Biodiesel Plant

Performed PHA and process engineering to increase esterification capacity and increase plant flexibility.

Project Engineering for Upgrade to 10 Million Gallon Biodiesel Plant

Performed PHA and process engineering to add esterification and increase plant capacity by 50%. Conducted all process engineering and project management.

RFS2 Certification (Plant Registration)

FBA has licensed PE's in nearly every state that biodiesel is produced. Our team of engineers provided independent engineering reviews for approximately 25% of the registered facilities.

Plant Acquisition Due Diligence

Provided comprehensive due diligence for biodiesel acquisition by established petroleum refiner including valuation, technical due diligence and feedstock/market assessment.

Project Development for 36 Million Gallon Biodiesel Plant

Provided direct support from inception to operation for second largest biodiesel facility in the U.S. at the time, including business plan, construction oversight and product off-take agreements.

Biodiesel Technology Evaluation

FBA conducted a technical evaluation of Greenline Industries processing technology for Leaf Clean Energy. The evaluation resulted in \$20 million Series A preferred stock financing.

30 Million Gallon Biodiesel Plant in Iowa with Multiple Feedstock Capability

FBA completed the comprehensive feasibility study for Western Iowa Energy. Plant is operating as one of the largest biodiesel facilities in the U.S.

Biodiesel Feasibility study for Largest Oilseed Processor in the World

Examined technical and marketing aspects of biodiesel production for multiple biodiesel locations in multiple states. FBA developed financial projections for various facility sizes.

Independent Engineering Services

Provided independent engineering services for a 25 million gallon per year biodiesel plant and a 40 million gallon per year biodiesel plant.

Feedstock Assessment for 50 Million Gallon Biodiesel Plant in Nebraska

Provided overview of available sources of feedstocks to supply large-scale biodiesel production facility in southeast Nebraska.

Marketing and Technical Reviews for 180 Million Gallon Biodiesel Plant at Coastal U.S. Location

Provided technical fatal flaw report and marketing production audit for large-scale biodiesel production facility in development.

Fatal Flaw Report for Large International Investment Bank

Provided technical evaluation of 105 million gallon biodiesel plant in development at coastal U.S. location. Currently serves as independent engineer for the financial institution.

Technical Evaluation of Biodiesel Processing Technology

Conducted a technical evaluation of a modular commercial biodiesel technology utilized in multiple facilities. The evaluation entailed site visits and interviews with representatives from multiple operational facilities employing the technology.

Comprehensive Study for \$51 billion Pharmaceutical Company

Feasibility of retrofitting an idled pharmaceutical facility into a large-scale biodiesel facility including capital and operating estimates.

Biodiesel Feasibility Study for Automobile Manufacturer

Examined the feasibility of a large-scale biodiesel facility utilizing truck, rail and barge transportation. Primary investor is a major car company.

Biodiesel Technology Analysis for Worlds Largest Meat Processor

Technical evaluation of viable technologies for converting various types of animal fat into biodiesel.

Global Fats & Oils Market Workshop

Conducted one-day seminar on availability and use of fats and oils for Fortune 100 Energy Company.

Comprehensive Marketing Analysis for Large International Investment Bank

Evaluated the market feasibility of an 86 million gallon biodiesel plant located at a port location in the Gulf of Mexico. Assessed the viability of utilizing imported feedstocks and exporting to biodiesel markets in the European Union.

Biodiesel Market Overview for World's Two Largest Debt Rating Agencies

Provided market-consulting services for first biodiesel plant debt issuance rated by top multi-national financial and investment research firms.

Renewable Diesel Process Review in Canada

Evaluated process technology to produce "green diesel" in Canada. Compared benefits versus production of methyl esters in Cold-weather Climates.

Biodiesel Feasibility Study in Canada

Evaluated feasibility of biodiesel production in Ontario in conjunction with a co-located soybean processing facility.

Technical Services for Proposed 200 Million Gallon Biodiesel Plant in the Bahamas

Provided preliminary engineering for large-scale biodiesel production facility in the Caribbean.

20 million gallon Biodiesel Plant in Michigan

Feasibility study, technology evaluation and project development services for first large-scale biodiesel plant utilizing multiple modular production units.

30 Million Gallon Biodiesel Plant in New Jersey

Feasibility study, business plan, and project development for a state of the art biodiesel facility.

Biodiesel Feasibility Analysis for stand-alone Facility in Virginia

Provided a clear and concise analysis to allow for a rapid start-up of a biodiesel facility. Plant was subsequently visited by the President once it became operational.

Statewide Biodiesel Feasibility Studies in Mississippi, Arkansas, Tennessee, Georgia, and Ohio

Developed comprehensive analysis as a basis for commercializing biodiesel projects in those states.

Biodiesel and Biomass Research Consultant for the University of Georgia

Provided input and support for biodiesel, ethanol, and biomass feasibility studies.

ETHANOL

Cellulosic Ethanol Technical Evaluation

Technology evaluation of cellulosic ethanol technology vendor for lending institutions.

Cellulosic Biomass Conversion Process Technical Evaluation in Canada

Evaluation of leading cellulosic ethanol technology for large capital investment firm.

Ethanol Feasibility Study for Large U.S. Based Chemical Company

Feasibility of retrofitting an under-utilized chemical plant into a large-scale ethanol facility, including capital and operating estimates.

Independent Evaluation of Multiple Ethanol Plants

Conducted due diligence engineer evaluation of multiple ethanol plants for private equity investment firm.

Ethanol Feasibility Study Using Unique Alternative Feedstock

Comprehensive feasibility studies for an East Coast ethanol plant that would utilize barley rather than corn. Assisted in successful project funding.

Dry Fractionation Ethanol Production Overview for Canadian Ethanol Plant

Provided overview of advantages entailed in fractionating corn germ for ethanol plants and co-processing the germ.

Iowa Ethanol Feasibility Study

Comprehensive feasibility study for stand-alone ethanol plant with a corn dry fractionation technology utilizing corn feedstock.

Indiana Ethanol Feasibility Study

Comprehensive feasibility study for stand-alone ethanol plant with a corn dry fractionation technology utilizing corn feedstock, and biofuels project with combined ethanol, biodiesel, and biomass uses.

Missouri Ethanol Feasibility Study

Comprehensive feasibility study for stand-alone 50 million gallon ethanol plant.

Mississippi Ethanol Feasibility Study

Comprehensive feasibility study for stand-alone 30 million gallon ethanol plant utilizing corn and milo.

CONSULTANT SUMMARY:

Kenneth E. (Pete) Moss – President - Mr. Moss became President and owner of FBA in 2006. He has over twenty-five years of professional experience in oilseed processing, Renewable Energy commercialization, marketing, business plans, and financial analysis. Mr. Moss has a comprehensive understanding of the Biofuels industry; feedstock and product value analysis and frequently speaks at financial summits and Biofuels seminars. He earned his bachelor's degree in management/marketing, and his masters of business administration (Executive MBA) from the University of Memphis.

Warren D. Barnes - Vice President - Over twenty-five years of professional experience in commodity processing and refining industries. Extensive operations and engineering skills applicable to both existing and new processing facilities such as oil refining and biodiesel production. Mr. Barnes has developed and implemented several innovative operator training and development programs. He is a leading industry consultant on operational and benchmarking audits as well as ISO 9000 certification. He received his bachelor's degree in mechanical engineering from the North Carolina State University, and his masters of management from Central Michigan University.

Gerald U. Sherfy – Vice President of Operations - Extensive experience in ethanol and biomass feasibility analysis and business plans. Mr. Sherfy has provided significant research and analysis for numerous ethanol and biomass projects and is a specialist in feedstock research and financial analysis. Prior to joining FBA, Mr. Sherfy worked in both the real estate appraisal and commercial finance fields. He received a bachelor's degree in physics and an Executive MBA (masters of business administration) from the University of Memphis.

Tim Gorman, P.E., Vice President of Engineering- More than 25 years of professional engineering experience in design, fabrication, construction oversight, start-up and commissioning of renewable energy, industrial, process and manufacturing facilities. Tim has worked as a design engineer and project manager of biodiesel, ethanol, manufacturing, and process facilities, plus as a field engineer in oilfield exploration and production. Prior to FBA he worked with API, Lurgi PSI, consulting engineering firms and was General Manager of Biodiesel Services Group. He has written many renewable energy process plant RFS2 reports for the EPA RIN verification and QAP programs. He is a registered professional engineer in ten states and registered as a Model Law engineer with the National Council of Examiners for Engineers and Surveyors.

Jeff Babb, PE – Technical Services Consultant – Over forty years process engineering experience in fuel ethanol, wet corn milling, food, beverage, and chemicals. Project involvement is from conception to start-up plus permitting and environmental audits. His Chemical Engineering degree is from the Georgia Institute of Technology. He is a licensed Professional Engineer in Georgia and Tennessee.

Sean Austin – Technical Services Consultant – A capable mind new to the industry, he brings his fresh perspective to the world of biofuels consulting. He has knowledge of innovative biodiesel production technologies and RFS2 regulations, as well as experience with evaluations of mass flow and energy balances. He graduated from North Carolina State University with his degree in Chemical Engineering.

Eric Tabor Jr. – Technical Services Consultant – A former intern for FBA, Eric graduated from the University of Tennessee with a degree in Biomedical Engineering. He is versatile in the work that he can do because he comprehends the processes and regulations of renewable fuels and actively seeks to work with customers. Eric provides in-depth analysis on process changes and the impact on yield and product quality. He is highly skilled in excel, creating many useful formulas and charts in spreadsheets.

Drew Hall – Technical Services Consultant – Drew graduated from the University of Tennessee with a degree in Nuclear Engineering. He is currently pursuing a Master’s Degree in Mechanical Engineering while working at FBA. Drew provides technical insight for renewable technologies and assists with RFS2 compliance. He has significant experience in AutoCAD, programming, and CFD modeling.

Amanda Smith – Feedstock Assistant - Ms. Smith specializes in feedstock procurement and is responsible for managing feedstock inventories for several biodiesel facilities. She is knowledgeable in the RFS2 regulations, and has worked extensively in helping facilities meet the EPA’s requirements for the Separated Food Waste Plans. She has also assisted on numerous feasibility studies and has experience with developing operator training materials.

Christen Andrews – Office Manager - Ms. Andrews provides all of the Accounts Receivables and Payables as well as project tracking. As Office Manager for FBA, Christen ensures that all FBA projects go smoothly and client interaction is seamless.