

Technical Engineering

Technology Reviews and Assessments

MATRIC provides full process technology evaluation for clients looking to invest in biotechnology or conventional chemical processes. MATRIC scientists and engineers have many years experience in reviewing patents, developing techno-economic models of processes, and evaluating current operations to identify strengths, weaknesses, opportunities, and challenges that can affect the commercial viability of a technology. Our reviews and due diligence assessments provide customers with the knowledge to more confidently assign value to intellectual property by focusing on the technological, economic and operational challenges and providing the information required for informed decision-making.

PROCESS	DESCRIPTION
New Biochemical	Reviewed process technology for bio-based route to a conventional chemical intermediate. Evaluated technology development progress and recommended priorities to prove technology viability.
Conventional Petrochemical	Reviewed economics and technology challenges to the development of multiple processes. Identified opportunity for unique intellectual property with competitive advantage.
Integrated Energy, Biofuel	Evaluated process technology combining alternative energy sources with conventional fuel production for potential investment by MATRIC client.

Process Improvement Services

MATRIC's staff has broad experience in process technology improvement which can be deployed to assist our clients in any stage of process improvement, including opportunity identification, prioritization, design, and implementation. Process improvements delivered by our engineers include reducing raw material and energy usage, improving operational reliability and product quality, and reducing the environmental footprint and greenhouse gas emissions from chemical processes. Our personnel are trained in a variety of improvement techniques, including Six Sigma, Kepner-Tregoe, Root Cause Analysis, and TRIZ. Our engineers enhance and supplement our customer's staff in all phases of process improvement to create or expand their competitive advantage.

PROCESS TYPE	BUSINESS	IMPROVEMENT
Batch	Specialty Chemicals	Process safety; flammability; raw material usage
Continuous	Petrochemicals	Raw material usage; reliability; energy usage
Batch	Polymer	Raw material usage; product usage; reliability
Semi-Batch	Biochemical	Raw material; product quality
Continuous	Energy	Reliability
Continuous	Biochemical	Energy usage

New Technology Process Engineering

MATRIC engineers, working in teams with scientists involved in technology development, are uniquely skilled in understanding and managing the risks and complexities of new technology implementation. Involving MATRIC in the early stages of a technology development project can reduce cost and cycle time as the technology development, risk mitigation, and design are completed in parallel. Additionally, MATRIC engineers always documenting the technology development process, helping to prevent technology transfer losses.



A key aspect of our approach is to evaluate the techno-economic aspects of the process repeatedly throughout the development stage with our clients as the technology becomes better defined. Our engineers then develop process packages that will improve the likelihood of commercial success by anticipating and understanding technology challenges to cost effectively incorporate contingency into the design.

Project Examples

Examples of completed process engineering projects include biochemical, biodiesel, integrated energy, petrochemical and recycling. MATRIC has prepared conceptual and basic process packages for customer technologies with capital estimates ranging from \$1 million to \$125 million. These efforts provide customers with timely engineering that allows them to more effectively manage technology risks. MATRIC engineers are experienced at developing the early stage process packages, such as FEL-1 and FEL-2, that form the basis for the technology transfer to conventional E,P, C companies.

TECHNOLOGY	DESCRIPTION	CAPITAL	EQUIPMENT COUNT	LOOP COUNT
Biochemical	Conceptual	\$10 MM	90	100
Petrochemical	Conceptual	\$12 MM	218	341
Biodiesel	Conceptual	\$20 MM	120	174
Biodiesel	Basic process	\$20 MM	120	174
Biochemical	Conceptual	\$100 MM	200	75
Biochemical	Basic process	\$100 MM	200	150
Biochemical	Conceptual	\$25 MM	50	25
Biochemical	Basic process	\$25 MM	50	25
Petrochemical	Conceptual	\$5 MM	75	50
Integrated Energy	Conceptual	\$125 MM	98	-
Recycling	Conceptual	\$1 MM	25	30
Petrochemical	Conceptual	\$80 MM	175	500

Mid-Atlantic Technology, Research & Innovation Center

