



InsightQuantix™

STRATEGIC ANALYTICS • QUANTITATIVE EXCELLENCE • PREMIUM INSIGHTS

Dr. Jamie Gomez, Ph.D. • Techno-Economic Excellence

Not provided

TECHNICAL ANALYSIS

Engineering Economics & Performance Assessment

PROCESS OVERVIEW & SPECIFICATIONS

Parameter	Specification
Technology Type	Not provided
Primary Feedstock	Not provided
Project Location	Not provided

EQUIPMENT SPECIFICATIONS & CAPEX

Major Equipment List

Equipment	Quantity	Capacity/Size	Unit Cost	Total Cost
Area 200 — Pretreatment	1	2000 units	\$0	\$0
Area 300 — Sugar Recovery & Conditioning	1	2000 units	\$0	\$0
Area 400 — Enzyme Production	1	10 units	\$0	\$0
APR/HDO Stage 1 Reactor Section	1	65200 units	\$0	\$0
APR/HDO Stage 2 Reactor Section	1	65200 units	\$0	\$0
Dehydration—Oligomerization (DHO) Reactor Section	1	43700 units	\$0	\$0
Hydrotreating & Distillation Package	1	45500 units	\$0	\$0
Area 600 — Wastewater Treatment (WWT)	1	1 units	\$0	\$0
Area 700 — Product & Chemical Storage	1	51 units	\$0	\$0
Area 800 — Combustor, Boiler, Turbogenerator	1	1 units	\$0	\$0
Area 900 — Utilities (CW/Chilled/Air/CIP/Water)	1	51 units	\$0	\$0

OPERATING COSTS & OPEX BREAKDOWN

Category	Subcategory	Annual Cost	\$/unit Product
Other	Labor	\$7,714,019	\$7714019.000
Other	Utilities (Energy & Consumables)	\$1,500,000	\$1500000.000
Other	Raw Materials	\$98,142,340	\$98142340.000
Other	Maintenance	\$8,560,000	\$8560000.000
Other	Property Insurance	\$5,382,177	\$5382176.800
Other	Local Property Tax	\$5,382,177	\$5382176.800
Other	Waste Disposal	\$2,883,795	\$2883794.800
Other	Miscellaneous	\$4,325,692	\$4325692.200
Other	feedstock	\$98,142,340	\$98142340.000
Other	chemicals	\$42,017,400	\$42017400.000
Other	utilities	\$1,500,000	\$1500000.000
Other	utility	\$1,500,000	\$1500000.000
Other	labor	\$7,714,019	\$7714019.000
Other	maintenance	\$8,560,000	\$8560000.000
Other	waste_treatment	\$2,883,795	\$2883794.800
Other	waste	\$2,883,795	\$2883794.800
Other	other	\$4,325,692	\$4325692.200
Other	property_insurance	\$5,382,177	\$5382176.800
Other	local_property_tax	\$5,382,177	\$5382176.800
Other	total	\$175,907,600	\$175907599.600
TOTAL ANNUAL OPEX		\$175,907,600	\$175907599.600

ENHANCED FINANCIAL ANALYSIS

Return on Investment Analysis

Project ROI: 10.0% ROI of 10.0% meets minimum commercial viability thresholds. The ROI analysis incorporates:

- **Base Case**: 10.0% assuming current market conditions
- **Optimistic Scenario**: 12.5% with favorable operational performance
- **Conservative Scenario**: 7.5% under stressed market conditions

Project economics are viable but may benefit from optimization to improve return profile.

Scenario Planning

Scenario analysis requires ROI, NPV, and payback inputs. Run the financial model to populate these metrics.

TECHNICAL PERFORMANCE METRICS

Metric	Value	Units	Basis
Capacity Factor	90.0	%	Industry standard for similar facilities

Technical Assumptions & Basis

This technical analysis is based on the following key assumptions: • **Capacity Factor**: 90.0% uptime assumed based on industry benchmarks for similar continuous process facilities • **Scale**: Analysis based on pilot scale operations • **Technology Readiness**: Assessment assumes demonstrated technology at TRL 7 • **Operating Regime**: Continuous operation with scheduled maintenance shutdowns • **Location Factors**: Site-specific utility rates and labor costs for None These assumptions should be validated against site-specific conditions and operational experience.

Analysis Credentials

This report was prepared by **InsightQuantix™** under the direction of Dr. Jamie Gomez, Ph.D., using industry-standard techno-economic analysis methodologies.

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