

# Powering Intelligent Plant Operations:

## AI-Powered Precision for EBIT Growth

Industries are navigating some of the most challenging market conditions in decades — marked by volatile crude prices, tightening refining margins, and relentless pressure on profitability. Traditional operating models, designed for stability, often falter in the face of dynamic market forces directly impacting EBIT. In this environment, self-optimizing autonomous plants are emerging as a strategic necessity. By enabling continuous process optimization, adaptive decision-making, and operational resilience, autonomous plants help enterprises safeguard margins, enhance asset availability, and maintain process stability.

Lummus Digital helps the energy and process industries turn potential into measurable outcomes. From strategic advisory to operational intelligence, we bring over a century of process engineering expertise to support margin protection, yield improvement, and the move toward autonomous operations across complex facilities. Our solutions, built on a process intelligence platform, integrate real-time plant data with hybrid models combining first-principles process knowledge and advanced AI/ML, enabling earlier detection of process deviations, stronger operational visibility, and faster, more informed decision-making.

# Turn Process Intelligence into **EBIT** Advantage!

Our solutions empower your plant's EBIT performance and reliability across 4 key aspects of business value:



## Autonomous Plant Enablement for optimized EBIT

Reduce manual load, automate transitions, and enable AI-driven decision-making



## Bottom-of-the-Barrel Economics

Maximize value per barrel through residue conversion and connected feedstock-to-downstream decisions.



## Intelligent Operations Optimization

Improve yield, energy, throughput, economics, and planning efficiency

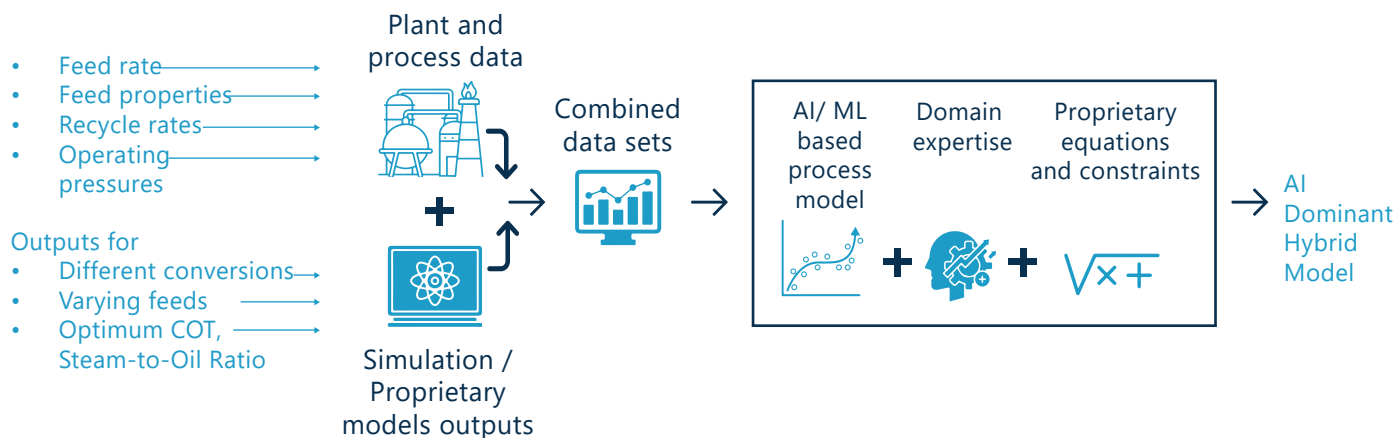


## Improving Plant Reliability & Risk Advisory

Reduce downtime, prevent failures, and increase asset availability

## Driving AI-Powered Solutions for Energy & Process Industry

We leverage hybrid modelling, combined with deep process knowledge and AI/ML



# Our Solutions



## Refining



### CDU & VDU Yield Optimizer

- Maximizes side stream yields
- Optimizes Vacuum Tower Bottom movement
- Reduces costs with real-time data



### LC-FINING Reactor Conversion Optimizer

- Achieve maximum conversion using real-time data
- Optimizes hydrogen use
- Predicts SHFT values



### Lube Oil Base Stock ( LOBS ) Optimizer

- Maximizes grade cut yields and lube oil output
- Optimizes viscosity



### Reactor Effluent Air Cooler ( REAC ) Advisor

- Predicts and prevents fouling and corrosion risks in Hydrocracking units
- Optimizes wash water management



### Hydrocracker Reactor Conversion Optimizer

- Provides real-time predictions of downstream feed
- Optimizes hydrogen consumption, and drives efficiency and profitability



### FCC Ethylene/Propylene Optimization Advisor

- Maximizes ethylene and propylene yields



### Product Stripper Reliability Advisor

- Prevents steam condensation



## Petrochemicals



### Ethylene Heater Optimizer

- Enables continuous optimization in real-time
- Yield Improvements of high value products
- Minimizes energy consumption and carbon emissions



### Ethylene Fractionator Optimizer

- Maximizes ethylene yield
- Minimizes slippage
- Optimizes utility use



### Charge Gas Compressor (CGC) Fouling Mitigator

- Optimizes Charge Gas Compressor performance by predicting fouling issues in real-time
- Reduces downtime



## Plant Operations



### Look, Listen & Feel Automation (LLF):

LLF Automation with Observer Driven Reliability (ODR) and OLPIS database delivers predictive insights from field data, boosting equipment reliability, enhancing process safety, and enabling faster, data-driven maintenance decisions.



### Real Time Optimization (RTO):

Optimization at real-time to maximize margin/yield of a Naphtha Cracker Unit.



### Hydrocarbon Accounting (HCA):

End-to-end hydrocarbon information management system i.e. computing the material balancing from the Naphtha load port to the HPL Plant dispatch gate

## Other Solutions



### **Catalyst AI (CataLLM) for accelerating hydrocracking catalyst design**

The AI-driven catalyst research and decision-support platform accelerates hydrocracking catalyst design by combining domain knowledge, patents/literature intelligence, and AI/ML models into a governed, traceable R&D workflow.



### **Electronic Proof of Delivery (ePoD) for real time tracking of goods transportation**

ePOD transforms finished goods deliveries with real-time tracking, error-free digital documentation, and instant proof of delivery ensuring operational efficiency, transparency, and a superior customer experience.



### **eLog for managing shift & crew handovers through Operating Envelope Logbook**

e-Log application is a complete solution for managing shift and crew handovers while capturing logbook entries to improve operational excellence in the plant. It provides a shared source of information to support effective communication during the plant operations.



### **B2B Connect- Customer Portal & Sales Tracker**

Digital sales platform for customers and dealers to enable direct customer contact and automation of pricing & incentive / discount processes



### **Treasury Management for streamlining complex financial operations**

Treasury Management streamlines complex financial operations and compliance, delivering real-time visibility, improved audit readiness, and reducing time spent on manual processes.



Lummus Digital brings physics-first intelligence to downstream energy combining deep process engineering expertise with advanced AI/ML to optimize refining and petrochemical operations from the inside out.

Born from decades of process technology leadership, we unite strategic advisory, process intelligence, and domain expertise to deliver what matters most: maximizing yields, protecting margins, and improving reliability across assets.

We don't overlay dashboards on your operations. We understand the thermodynamics, kinetics, and mass-energy balances behind them, and that's what makes the difference.

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