S&P Global Commodity Insights Creates Sustainable Value for the Oil Industry with AspenTech and AWS

In collaboration with

Overview

As a division of S&P Global, Commodity Insights provides respected benchmarks, perspectives and solutions for commodity and energy markets, helping customers zoom in on the near term and zoom out for the big picture. By enabling decisions that create sustainable value, S&P Global Commodity Insights helps accelerate progress in the world.

In partnership with AspenTech and built on high-performance cloud infrastructure with AWS, S&P Global Commodity Insights developed a solution that is helping to transition their existing refinery cost curve and margin model into a new fully optimized global refining linear programming (LP) model. The solution is the first of its kind in the competitive oil and refinery industry.

Data is the new oil

Data is at the heart of process manufacturing and swift decision making is its lifeblood--especially critical in the rapidly changing landscape of the oil and refining industry. Unfortunately, traditional methods involving extensive data collection and analysis can be inefficient which makes it difficult to perform analytics on the data. Those analytical capabilities are critical to helping oil producers remain competitive.

S&P Global Commodity Insights built an initial solution for its oil and refinery customers and traders—Refinery Cost & Margin Analytics (RCMA)—a solution which provided an intuitive way to facilitate benchmarking in the global refining industry that supports performance, competitive standing, and data-led decision-making. But, as technologically advanced as the initial solution was, customers continued to push for greater optimization capabilities—ways to achieve more accurate, more robust results—something simply not possible without an even more powerful, broad-reaching solution.

S&P Global (NYSE: SPGI) provides essential intelligence. We enable governments, businesses and individuals with the right data, expertise and connected technology so that they can make decisions with conviction. From helping our customers assess new investments to guiding them through sustainability and energy transition across supply chains, we unlock new opportunities, solve challenges and accelerate progress for the world. With every one of our offerings, we help the world's leading organizations plan for tomorrow, today. For more information, go to www.spglobal.com

S&P Global Commodity Insights responded to these customer demands by moving to an approach powered by Aspen Unified PIMS, an automated solution that enables expanded production planning and optimization capabilities to help users to understand the push and pull of supply chain, sourcing, and demand. The AspenTech solution is used by 70% of global refineries worldwide to optimize output, maximize the value chain, and reduce costs.

Breaking new ground in a complex industry

S&P Global and AspenTech had already worked collaboratively together to serve customers for years, so it was natural to turn to their long-time partner to help them build something that pushed the boundaries of what had been done before. S&P Global Commodity Insights approached AspenTech with a question: "What if we could create not one model in one refinery or a small handful, but a model that could run multiple scenarios and that could encompass global oil refineries?"

Whiteboarding sessions gave way to the development of a proof of concept. With the new Aspen Unified PIMS (AUP), a browser-based application that allows for cloud computing, the companies approached AWS for a cloud-based architecture that could reliably meet higher compute-performance needs for running much more robust scenarios, encompassing more data sets, and with the potential to scale. "Moving from a desktop system to a cloud-based model opens up all kinds of possibilities for our customers," says Andy Winter, Senior Director of Development, S&P Global Commodity Insights. "It allows many more cases to be run. What used to take a week has been significantly reduced—it's just a huge step forward and enables our customers and analysts to be so much more strategic in their roles, rather than just crunching numbers all day."

The partnership has transformed the capabilities of RCMA into a cutting-edge solution that promises to transform the industry. As well as enabling the core RCMA data with Aspen Unified PIMS, a new service has been developed called Refining Scenario Manager which provides an intuitive, cloud-based interface that analyzes complex, user-defined scenarios of crude turnarounds, marginal value, refinery and downstream product breakeven pricing, and much more. With high performance cloud computing powered by AWS, the architecture is currently running at 40,000 scenarios and, according to David Daines, AWS Global Alliance Manager, the system is poised to soon run 80,000 scenarios with more than 10X improved time to solve.

"Moving from a desktop system to a cloud-based model opens up all kinds of possibilities for our customers," says Andy Winter, Senior Director of Development, S&P Global. "It allows many more cases to be run. What used to take a week, now takes 30 hours—it's just a huge step forward and enables our customers and analysts to be so much more strategic in their roles, rather than just crunching numbers all day."

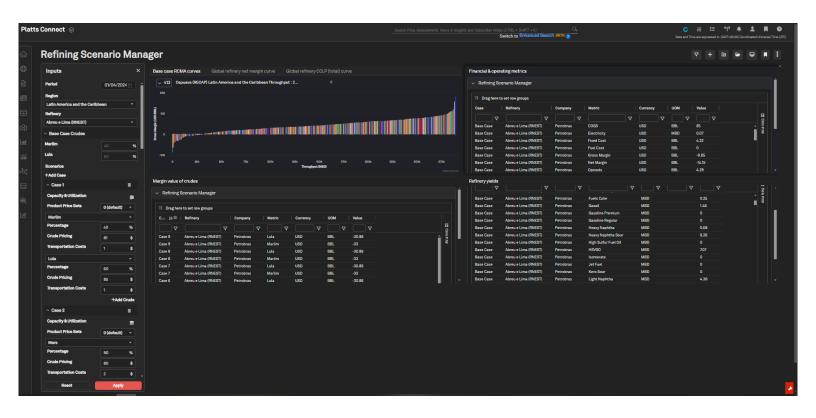**Andy Winter**,
Senior Director of Development,
S&P Global

Better models mean more informed decisions

The new Refining Scenario Manager solution is a robust linear programming (LP) model that can handle various refinery configurations and conditions that enable users to analyze margin impact, maximize throughput, and avoid shutdown. Its cloud-based interface is available through Platts Connect, a platform hosted by S&P Global Commodity Insights that allows users to access their products and services. It makes data available in near real-time on every single connected device. Once users select the input data, the solution will prepare, execute, and update the LP model runs to the Platts Connect environment within a few minutes, allowing anyone to perform an LP analysis in near real time.

Its modelling capabilities are agnostic, potentially suitable for every refinery in the world and providing a broad range of advantages, enabling users to:

- Change capacities, utilizations, and modes of operations for any global refinery
- Perform turnaround analysis by turning off various process units and/or refineries
- Analyze capital projects by evaluating margin analysis across process units
- Model and understand impacts to refinery yields in a range of scenarios
- Select any crude and grade from the crude library
- Input user-specific crude prices, product prices, and transportation costs

Refinery Scenario Manager Dashboard

Faster decision making

For users like one S&P Global Commodity Insights customer in Poland, speeding reaction time to an outage will enable them to allocate accurately the volume of products moving through the pipelines to supply specific regions, enabling them to react faster and capture opportunities while their competitors are still running calculations.

When a supply chain incident occurs, for example, users can lean into hundreds of crude assets and process measures readily available as drop downs, and quickly model new scenarios to perform a new project analysis to see how their results would be impacted, find process anomalies, and uncover new opportunities as they arise and protect against disruptions.

Maintaining regulatory compliance

In addition to wringing the most out of operations and assets, the Refining Scenario Manager solution can help users to improve their compliance with changing regulatory requirements. For example, the International Sustainability Standards Board requires companies now to do resilience studies on their businesses and on their assets. As refineries seek to understand the impact of carbon prices, emission reduction initiatives, and other changes that will affect their margins and compliance long term, the methodology in RCMA will enable strategy teams to do a broad range of long-term analysis using customized scenarios through the model to be able to generate different sets of outputs. It's a use case that hasn't really existed up till now.

Lowering barriers to entry

Modelling and analytics in this field have typically been carried out by highly skilled workers who were often siloed into refineries and niche markets. S&P Global Commodity Insights wanted to change that dynamic by making ease of use a key goal for solution development. Instead of requiring process engineers with 15-to-20 years' experience, the easy-to-use interfaces in RCMA and Refining Scenario Manager provides less experienced users with sets of common, automated scenarios, available as a series of drop-down choices to help drive complex analytics faster.

Simpler modelling capabilities also open the door to oil traders, investment banks, and other companies that can take advantage of a rigorous refining market analysis tool.

Financial institutions or insurance companies that used to hire third party contractors to analyze the assets used to finance or ensure refineries can now do it themselves.

> "Instead of a chemical engineer at a major oil company with 20 years of experience using this solution, we are seeing a manager in the trading arm of an energy company, or a risk analyst at a bank using this solution."
>
> **Henry Potter**,
> Principal Solution Consultant,
> AspenTech

Early wins and what's next

The next stage of product development will see expansion into the energy transition world, with capabilities to support biorefineries, as well as other renewables, according to Asad Khan, Director - Global Refining Optimization & Margin Analytics at S&P Global Commodity Insights. "These capabilities have an impact not just on global refineries, but also enable upstream and downstream users to optimize their decision-making. The market opportunity is extensive and continues to grow."

Although the solution is in its early stages of deployment, the team has already heard from customers who are thrilled with the new capabilities. Traders at a German refinery typically purchase crude on a 3-month schedule, based on demand forecasted by its headquarters—a forecast that typically takes some time to run through its in-house model. "When we've presented the capabilities of the new models—being able to generate results faster or validating and benchmarking internal models—they were left speechless," said Dmitri Timokhin, Director, Commercial - Team Leader, S&P Global Commodity Insights.

The team continues to leverage the solution to help clients assess production and refinery outages and sees opportunities to further help clients evaluate the impact of shutdowns on supply, demand, and trade.

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Conclusion

By spearheading the new RCMA solution, S&P Global Commodity Insights has helped to democratize both global refinery benchmarking and LP modeling technology. The optimization approach to refining market analysis is now available to larger professional circles, enabling improved business analysis and decision-making in the refining market.

Over the 20 to 30 months of development to testing to launch, Kahn notes the importance of collaboration to the success of the project. "All along the way we've maintained sight of our North Star and what we've accomplished really does speak to the spirit of collaboration maintained throughout the project."

About Aspen Technology

Aspen Technology (NASDAQ:AZPN) is a global software leader helping industries at the forefront of the world's dual challenge meet the increasing demand for resources from a rapidly growing population in a profitable and sustainable manner. AspenTech solutions address complex environments where it is critical to optimize the asset design, operation and maintenance lifecycle. Through our unique combination of deep domain expertise and innovation, customers in asset-intensive industries can run their assets safer, greener, longer and faster to improve their operational excellence. To learn more, visit AspenTech.com

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