CASE STUDY | Evonik Oxeno

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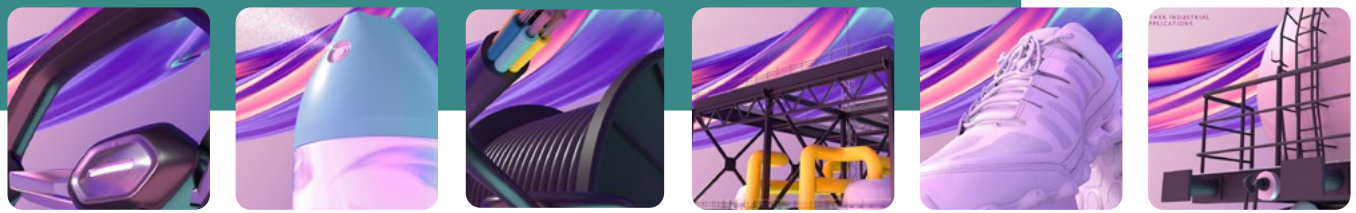
How Evonik Oxeno boosts supply performance with decision-centric planning

Evonik Industries AG / Dirk Bannert

Evolutions in the oil, gas, and specialty chemicals markets have made planning the supply of Evonik Oxeno more complicated than ever.

As raw material quality and downstream demand became less predictable, the company began to understand that a more flexible decision-centric tactical planning process, driven by reliable demand and supply data, was needed.

After implementing OMP Unison Planning™, Evonik Oxeno can now create and evaluate multiple supply scenarios every day, leading to more reliable plans and better service. "This flexible scenario planning was a tremendous game changer for us," according to Evonik Oxeno's David Kochanek.



Evonik Oxeno: a complicated side-stream

Kochanek has been working as a business process specialist at Evonik Oxeno for ten years. During that time, he has witnessed how business at the plants in Marl (Germany) and Antwerp (Belgium) has grown in size and complexity.

"Evonik Oxeno is a major producer of C4 chemicals," he elaborates. "We have been producing C4 chemicals for more than 50 years. With this experience, we have developed a cross-site production network that is unique in the world. In Marl and Antwerp, we process around two million metric tons of raw material per year. This corresponds to five tank cars per hour."

"And besides being huge, it's also complex. The C4 stream is, in fact, a side-stream, processing the leftovers from polyethylene and polypropylene production. However, these raw materials vary a lot in concentration, depending on the cracker operation mode. This presents a major challenge to our planning process."

Kochanek also notes that in the C4 stream, prices of raw materials and products are subject to significant variations, which further complicate matters: "We, in fact, negotiate pricing formulas with our suppliers and customers, where we agree on factors that influence price, such as the brand of naphtha or the different concentrations."

"The composition of our raw materials is very variable, and that complicates how we plan the production processes that follow."

David Kochanek
Supply Chain Solution Manager

Seizing on market signals

In addition to facing a more complex supply, Oxeno was also increasingly challenged by the dynamics of downstream markets. Kochanek: "Ten years ago, we primarily focused on optimizing our supply, producing more or less regardless of expected demand, and selling our products to our known customer base. But over time, these markets have become much bigger and more diversified, also in terms of the price customers are willing to pay for certain products at a given time."

"**We understood that this gave us opportunities to increase revenue and reduce costs, but then we would need to go to the market in a rather different way.** We needed to get better insight into expected demand and proactively negotiate with potential customers."

First steps to increased visibility

Evonik Oxeno's existing planning apparatus, which was mainly based on elaborate Excel sheets, proved too cumbersome in this context. Multiple people were managing various aspects of the planning using different non-interconnected spreadsheets. Data had to be copied and transferred manually from one sheet to the next. Therefore, it always took a lot of time and effort to establish a clear overview of Oxeno's production of Marl and Antwerp as a whole.

An in-depth evaluation of supply chain planning solutions led the company to launch a project to implement OMP for Chemicals, focusing as a first step on integrating the operational planning of Marl and Antwerp. Kochanek: "**We first got the basics in order by aligning both sites on operational planning and scheduling.** That was already a big leap forward in terms of visibility. It also allowed us to get a better grip on input and output quantities when we were faced with daily variations in input concentrations."

"Implementing even the basics of operational planning gave us more visibility and a better grip on input and output quantities."

Growing in-house expertise

Evonik Oxeno is currently investigating the use of machine learning methods to enhance their S&OP practices. Kochanek explains: "We're creating and working on a whole repository of scenarios developed by planners. **We would like to use machine learning to identify the scenarios that perform best in terms of our KPIs.** We believe that this is a very effective way to capture and secure our most experienced planners' knowledge in this area."

"Junior planners can find invaluable inspiration in this repository if there's no senior planner immediately available. It's a great way to grow our in-house expertise further. Over time, we might even hire a dedicated AI engineer in support of the planners."

Extending the supply chain by connecting with strategic partners

The chemical industry can be seen as a global ecosystem with multiple corporations working closely together. **Companies are increasingly setting up extended supply chains with interconnected planning systems so that critical supply data can be shared in real-time.** "We're also setting up this kind of bi-directional integration with strategic partners, some of whom also use OMP," says Kochanek. "The integration might involve both parties getting insight into product availability or purchase requests being processed automatically. It saves us a lot of time we'd normally spend on sending emails, making phone calls, or waiting for someone to get back to us."

"Some would argue that this kind of integration could be done directly between ERP systems, but that wouldn't work in the C4 stream business. The point is that there are always a lot of things to be checked before a purchase order can be submitted — things like the availability of barges and jetty slots, and tank capacities. That's why the extended supply chain is so valuable to us."

"We created a centralized and integrated supply chain department of over 20 people responsible for all supply chain matters."

Upgrading the organization

At the same time, demand forecasting was implemented to make the **transition from a supply-oriented to a demand-oriented responsive production model**. For Kochanek, the biggest challenge was organizational: "It required our marketing and sales people to adopt a different attitude. They needed to engage more with individual customers, proactively talk to them to find out how much they would be willing to buy from us against the price we were hoping to get, and so on. This could be combined with results from the statistical forecasting and the constraints imposed by supply."

"But this new way of working wasn't compatible with our organizational structure, where supply chain management was in the hands of one person located in the production department. We changed that and created a centralized and integrated supply chain department of over 20 people responsible for all supply chain matters, including planning, calculations, reporting, and logistics."

Developing scenarios, the easy way

The decisive step towards boosting supply came when decision-centric sales and operations planning was implemented. S&OP would tie all the pieces together, allowing the company to optimize supply almost continuously, but Kochanek had to admit it took a while before the process and the solution was fully embraced. "Initially, our people found it hard to develop supply scenarios and even harder to understand and trust the results of the calculations that followed."

Evonik Oxeno subsequently worked closely together with OMP consultants to finetune the solution to their needs, developing an innovative smart workflow framework. Based on behavioral design principles, it captures user decision intelligence and uses that to quickly build a wide range of relevant scenarios, with calculations being performed overnight and in the background during the day. As a result, decision-making is now much faster and more efficient. **Unison Planning is able to evaluate 100+ what-if scenarios in the course of a few days, and each scenario provides additional insights that can be used to further optimize tactical decision-making.** The solution is even capable of adjusting scenario parameters autonomously based on calculated outputs and within user-defined boundaries.

"The decision-centric framework allows planners to create multiple scenarios, with calculations performed overnight."

Working towards the best scenario

Kochanek confirms that this was a real game-changer: "The system allows planners to create hundreds of scenarios per week. They might define scenarios with different levels of capacity utilization, raw materials, and stocks. And they might set priorities differently. So, they can experiment with production parameters they're familiar with, which raises the confidence level."

"And once they're calculated, the results of each scenario are evaluated against our strategic business KPIs. Planners can use the results to develop even more scenarios over the following days, which again raises their confidence in the system. **This scenario-based decision-making has tremendously enhanced trust in the system, among planners as well as business executives.**"

"Each scenario is evaluated against our business KPIs, and planners can use the results to develop even more scenarios in the following days."

Sustainability as a major factor

In recent years, sustainability has become a more prominent consideration in managing and planning the chemical supply chain. Kochanek confirms: "It's a major factor for us now, and it's increasingly reflected in our planning practices. For example, we're using our OMP planning solution to reduce the volume of intercompany transport between Marl and Antwerp. We also try to deliver from the site nearest to the customer so that we reduce the transport footprint."

" This scenario-based decision-making has tremendously enhanced trust in the system, among planners as well as business executives."

About OMP

OMP helps companies facing complex planning challenges to excel, grow and thrive by offering the best digitized supply chain planning solution on the market.

Its Unison Planning™ concept has a unique approach. It handles all supply chain planning challenges in a unified way. It's full scope and in-depth. Unison Planning™ synchronizes all planning stages, horizons, functions and roles. From source to deliver, from strategic to operational planning. The unique combination of services and technology boosts collaboration throughout your value chain, from forecasters to schedulers, from business leaders to technology experts.

Unison Planning™ is a cloud-based, out-of-the-box solution for industry-specific challenges. Hundreds of customers in consumer goods, life sciences, chemicals, metals and paper & packaging run it to make the right decisions at the heart of their business. Valued as a thought leader by experts as Gartner, OMP invests one out of every three dollars earned into innovation.

OMP for Chemicals is an industry-specific solution tailored to the chemicals industry, and already in use at more than 250 plants.

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About Evonik Oxeno

Evonik Oxeno, a wholly-owned subsidiary of Evonik, is a leading company in C4 chemistry with 50 years of experience, operating two world-scale C4 production facilities in Marl and Antwerp. The flexibility of its integrated network allows Oxeno to quickly and efficiently respond to changing conditions in supply and demand, optimizing the complexity of value chains also for its suppliers and customers. Oxeno is recognized for its focus on innovation and sustainability, maintaining an impressive portfolio of approximately 2,500 patents and patent applications. Its C4 strategy is based on a solid foundation and defined measures for growth and transformation. The company's vision, "Chemistry4Future® – We increase the value of C4 chemicals sustainably," outlines its long-term goal and provides a clear idea of where it aims to see its business in the future.


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