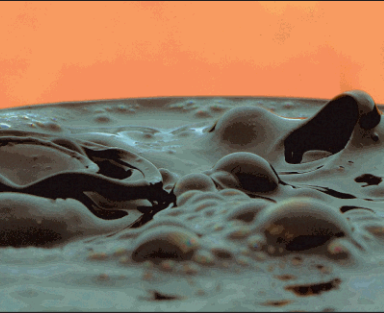




## Integrated Planning and Scheduling Enables Rapid Response to Market Opportunities



### Profile

Nynas, owned by PDVSA (50%) and Fortum (50%), is the global leader in Naphthenic oils and one of Europe's leading Bitumen suppliers. With its corporate headquarters located in Stockholm, Nynas operates four refineries of its own and two partner refineries in Europe and one partner refinery in Curacao. Nynas has approximately 800 employees.

Nynas' product portfolio consists of Bitumen (70%), fuel (15%), and Naphthenic and other specialty oils (15%). Nynas' vision is to be the global leader in naphthenics and bitumen.

### Business Challenge

In the late 1990s, Nynas was faced with the following business challenges within its supply chain:

- fragmented data sources
- separate, individualized and non-standardized planning bases
- scheduling carried out with insufficient IT support
- weak links between corporate planning and refinery planning
- poor visibility into the production plan across the organization
- sub-optimal refinery production schedule

In an effort to identify opportunities for improvement in its supply chain, Nynas retained a leading consulting firm to perform a study of its supply chain. The study was specifically focused on planning and scheduling/data integration for the optimization of its refineries.

The study recommended that Nynas streamline the manual processes used for data collection to allow more time to focus on data analysis. The study also recommended

that Nynas link the individual refineries more closely to the corporate planning process. "Planning was previously based on Excel models which means that plans were sub-optimized, marginal value/cost of production was not known, and the cost of continuous changes was also not known. This equated to a major opportunity loss that needed to be rectified," remarked Tomas Montin, Planning Manager, Logistics, Nynas Refining AB.

### Solution

Following the recommendations of the study, Nynas began to search for a solution that would enable it to improve its supply chain management processes and link its refineries more closely with corporate planning in Stockholm. Nynas selected AspenTech's supply chain solution, which includes Aspen PIMS™ (planning) and MIMI™ (scheduling), after a competitive selection process. "At the end of the day, the best choice was AspenTech not only due to its fulfillment of technical criteria but also because AspenTech recognizes the needs of our industry and possesses a deep knowledge of the supply chain," said Montin.

The Integrated Planning and Scheduling System (IPSS) was initiated in 2000 in order to optimize the use of constrained resources in Nynas' supply chain. The scope of the project included the following **accomplished within the framework of corporate planning:**

- optimization of the Nynashamn and Antwerp refineries
- Bitumen depot replenishment planning
- optimization of Continental Supply Sourcing

The philosophy of IPSS is to utilize the same information for planning and scheduling at different levels in the supply chain by implementing work processes where production, distribution, and feedstock supply are optimized in consecutive steps. The global optimization is carried out by the Supply and Planning division and the plan is propagated down to the detailed daily scheduling of refineries and depots. 'Downstream' planning and scheduling is loyal to the decision taken upstream, to ensure that the global optimization targets are met. The information is used in such a way that costs are minimized and revenue maximized. Input data is transparent and understandable.

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Planning Manager  
Logistics  
Nynas REFINING AB

AspenTech's supply chain solution is the backbone of Nynas' reengineered supply and planning processes. The activities accomplished through PIMS/MIMI are:

- generation of a local LP with the same starting date as the corporate LP and a duration of 84 days
- weekly checks of compliance against the plan
- generation of a monthly production report
- generation of a weekly-optimized refinery schedule and depot replenishment plan
- development of production orders
- monitoring of planned vs. actual production for the 84-day refinery schedule
- daily feasibility checks of plan

The Refinery LP (PIMS):

- optimizes the utilization of the crude unit
- optimizes yields and capacity utilization in the three hydrotreater units
- optimizes utility unit utilization
- ensures inventory feasibility
- optimizes blending
- optimizes internal fuel production

The Refinery Scheduling system (MIMI):

- identifies the activities to minimize change over costs within each time bucket sequence
- produces a feasible and optimized schedule

The Antwerp Supply Sourcing model is the primary source of optimization for the make versus exchange decision in Nynas continental bitumen market. The design of the supply and demand balance elements of the business solution encompasses the product supply agreement terms between Nynas and Petro+ regarding the Antwerp and Cressier refinery, a detailed description of all the exchange deal contracts, storage and throughput constraints for depots across Europe, agreements with upgrade partners for product transformation or purchase as well as transfers to and from other Nynas refineries.

The model accepts a dynamic product list and considers blending from base products to final products at different stages according to custom product specifications and dynamic recipes. Several modes of transportation are taken into account, each with the associated cost.

## About AspenTech

Aspen Technology, Inc. is a leading supplier of enterprise software to the process industries, enabling its customers to increase their margins and optimize their business performance. AspenTech's engineering solutions, incorporating Hyprotech's technologies, help companies design and improve their plants and processes, maximizing returns throughout their operational life. AspenTech's supply chain manufacturing solutions allow companies to run their plants and supply chain more profitably, from customer demand through to the delivery of the finished product. Over 1,200 leading companies rely on AspenTech's software every day to drive improvements across their most important engineering and operational processes. AspenTech's customers include Air Liquide, AstraZeneca, Bayer, BASF, BP, ChevronTexaco, Dow Chemical, DuPont, ExxonMobil, GlaxoSmithKline, Lyondell Equistar, Merck, Mitsubishi Chemical, Shell and Unilever. For more information, visit [www.aspentech.com](http://www.aspentech.com).

The solution determines the optimal sourcing and distribution pattern which will satisfy the forecasted demand based on the least cost and given all the exchange deal restrictions, depot capacity and throughput, upgrade partner deals, inter-refinery movements, transportation cost and blending constraints.

The user can view the solution through reports. In addition, a powerful graphical representation of the detailed based on maps has been developed. Results can be exported to Excel files. In addition, the model is fully integrated with the main Nynas Resolution database.

## Business Benefits

Today, Nynas has optimized its entire supply chain and has shifted its focus on cost-based decision making. "In PIMS, we can now see costs linked to average production costs which allows us to make business decisions that maximize our capacity while ensuring that we are taking on orders that are the most cost efficient," said Montin. "Nynas is also better positioned to respond to changes in market demand. If there is an unexpected increase in demand, we can easily re-run the model with the increased demand to see how it fits into the schedule."

The overall benefits are:

- **ability for Nynas to close the loop between the plan, the production schedule and the actual output**
- **closer links between corporate planning and the refinery scheduling**
- **enhanced visibility of plant operations through transparent planning and scheduling processes**
- **ability to respond rapidly to market opportunities**

AspenTech's supply chain solution allows Nynas to work on its long-term production strategy on an ongoing basis. **"In PIMS, we can now see the shadow cost of transfer prices to answer what to do to produce the last tonnage. When we sell those products to Bitumen and Napthenic companies, we then have a price linked to the average production cost. If we have high margin costs, it provides a basis for questioning whether we should continue to take on similar orders in the future. Having visibility into this information facilitates discussion about our long-term planning."**

## Vision

Nynas recently signed an agreement with AspenTech for Collaborative Forecasting and Demand Management for its Bitumen business. The solution will enable Nynas to predict future demands and create more accurate production forecasts. The integration of the Demand Management solution with IPSS gives Nynas a true end-to-end integrated Supply Chain System.



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