

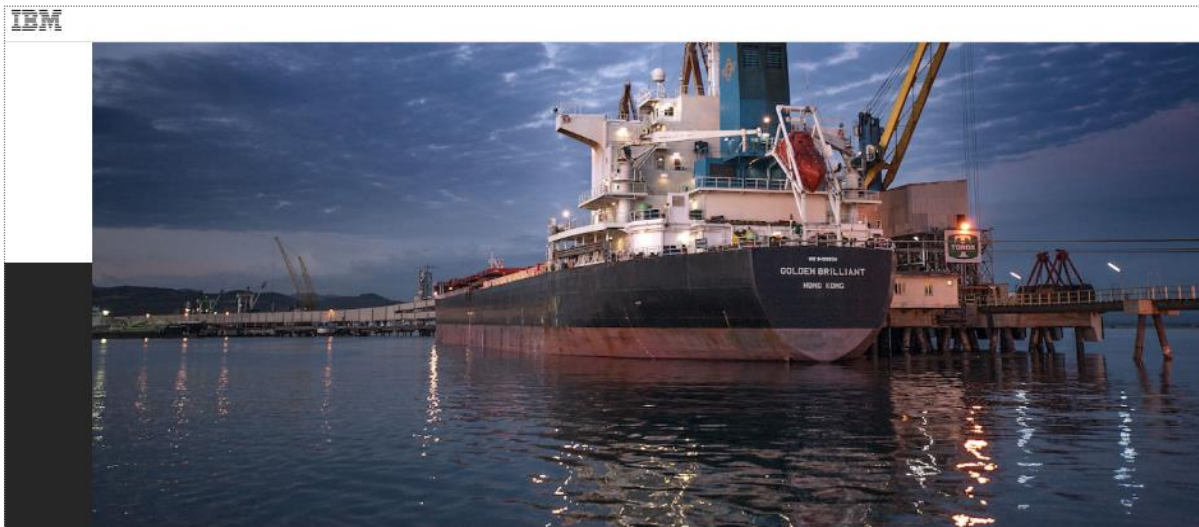
Solution: IBM ILOG CPLEX Optimization Studio

Industry: Fertilizer Production

TOROS - TEKFEN Agri-Industry Group

Led by a leadership passionate for managing by facts, a sophisticated solution is created to make complex supply chain decisions faster, more accurately and more effectively

The strategic planning team has a unique tool developed on IBM ILOG Optimization Studio that helps them to deliver optimum decisions with respect to purchasing, production, warehousing, and distribution. They can now analyze all the necessary what-if scenarios to optimally adapt to the volatile business dynamics and guide their organization to increase the gross margin of the operations and utilization of company assets.



Optimization scenarios that once took days to prepare can now run in under

30

minutes

The IBM optimization platform enables Toros Tarim plants to achieve more than

95%

capacity usage and demand coverage



IBM

Increased profit margins through insightful analysis

After the first year of running simulation models created by the IBM ILOG CPLEX Optimization Studio solution, Toros Tarim has seen operational improvements across its supply chain, including:

- Utilizing more than 95% of total production capacity and distributing demand more evenly among all three manufacturing plants
- Covering more than 95% of the demand received from customers for fertilizer products and finding the best fertilizer recipes to meet customer demand at the minimum possible cost
- Distributing demand more evenly between all eight warehouses, foreseeing the capacity for each storage area and finding the best storage location to ensure minimum logistics cost
- Minimizing total costs from raw materials procurement to production through detailed model simulations
- Finding optimum solutions and strategies to fulfill market demand without losing opportunities to make a profit

"This optimization model enables us to run simulations and foresee business conditions up to 12 months ahead," says Göral. "It also lets us establish prices, identify staff count norms, optimize stock quantities in storage areas and set long-term purchase agreements."



TOROS TARIM

About Toros Tarim Sanayi ve Ticaret A.Ş.

Based in Istanbul, [Toros Tarim](#) was founded in 1974 and started making fertilizer in 1981. It is the flagship company of Tekfen Agri-Industry Group, Turkey's largest privately owned business in its field. With over 800 employees at plants in Ceyhan, Mersin and Samsun, Toros Tarim is Turkey's largest fertilizer producer and ranks 63rd on the list of Turkey's Top 500 industrial firms.

About Selco Consulting

IBM Business Partner, [Selco Consulting](#) is an Istanbul-based consulting company with extensive capabilities in supply chain and logistics management. By combining information technology and advanced analytics, Selco provides multidisciplinary expertise for supply chain consulting, business analytics, software consulting, material handling logistics and warehouse logistics.

Solution component

IBM® ILOG® CPLEX® Optimization Studio



Business challenge

To respond to evolving business needs with agility and explore strategies to improve gross margins, TOROS TARIM wanted a decision-making platform to optimize its end-to-end supply chain decisions.

Challenges & needs

The leading player in the chemical fertilizer industry, Toros Tarım, TEKFEN-AGRI Industry Group Company, produces over 2 million metric tons in hundreds of different products. A challenge for supply chain is to select which recipe to be used, as a product can be produced in one or more of the three plants (with different technologies), two of which can also produce some of the key raw materials. The sourcing decisions become more complex when key raw material prices globally fluctuate, as the option to shifting to cheaper recipes may consequently create other capacity constraints or increased supply chain costs for production and distribution.

The need is to have a flexible tool, which creates an 18-month rolling plan, maximizing the gross margin of the company by matching profitable demand volumes to a minimized end-to-end total cost to serve.

Competence of managing volatile demand, BOM complexities, plant capacities, and fluctuating raw material prices, with respect to rigorous sourcing, manufacturing, warehousing, and distribution constraints should also be supported by a capability of what-if scenario analysis to better assess, avoid, and mitigate supply chain risks.

Transformation

Led by a leadership passionate for managing by facts, a sophisticated solution was developed on IBM ILOG CPLEX Optimization Studio, which supports strategic planning teams to understand how their supply chain can adapt to the sourcing and demand challenges and to make complex decisions faster, more accurately and more consistently.

Solution

The optimization tool finds the optimum decision set, which

- Balances production capacities against source options
- Sources raw materials at the right price, quantity, route
- Produces/procures semi-products at right quantities
- Selects the most cost effective BOM for finished goods
- Produces to demand/stock for best capacity leveling
- Pre-stocks to distribution network to optimize costs
- Fulfills demand from most effective source locations

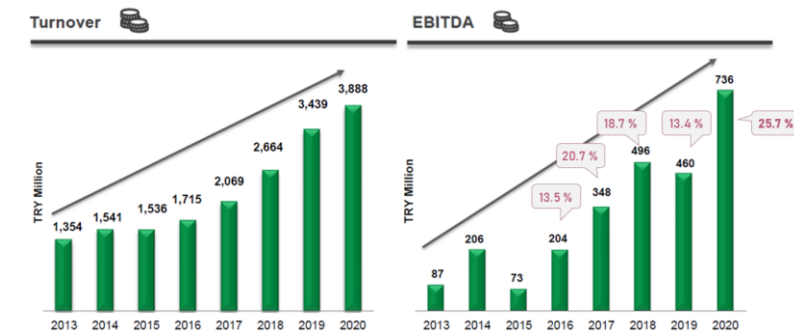


Results

The supply chain optimization model, comprised of 7 million variables and over 1 million constraints, runs on an IBM ILOG CPLEX Optimization Studio, under 15 minutes to deliver the optimum decisions with respect to purchasing, production, warehousing, and distribution. The strategic planning team has a unique tool that helps them to analyze what-if scenarios to optimally adapt to the volatile business dynamics, increasing the gross margin of the operations and utilization of company assets.

Benefits

- Decreased strategy impact analysis from days to minutes
- Sensitivity analysis for pricing / sourcing strategies
- Increased gross margin for every business case
- Better asset utilization
- Improved risk management





IBM ILOG CPLEX Optimization Studio is a consolidation of the OPL integrated development environment and the CPLEX and CP Optimizer solution engines in a single product. CPLEX Optimization Studio provides the fastest way to build efficient optimization models and state-of-the-art applications for the full range of planning and scheduling problems. With its integrated development environment, descriptive modeling language and built-in tools, it supports the entire model development process. CPLEX, a feature of IBM ILOG Optimization Studio, offers state of the art performance and robustness in an optimization engine for solving problems expressed as mathematical programming models.
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SELCO Consulting is a recognized consulting company with distinguished capabilities in supply chain and logistics management, delivering outstanding results and helping clients to use their resources more effectively by combining leading information technology and advanced analytics.

Our culture based on integrity and diligent effort, coupled with exceptional passion for delivering results enable us to retain and develop our customer base across all major industries and service sectors. Our partners around the globe with unique knowhow clusters accelerate and enhance the value of our services.

We provide consulting services for

- Supply Chain Transformation
- Business Analytics
- Advanced Planning Software Implementation
- Factory & DC Design

We are a team, always proud to do the right by our clients, our partners, and our communities.

Excellence is not a single act, but a habit