

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.



### Business challenge

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

### Business challenge story

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 export these components and shift 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.

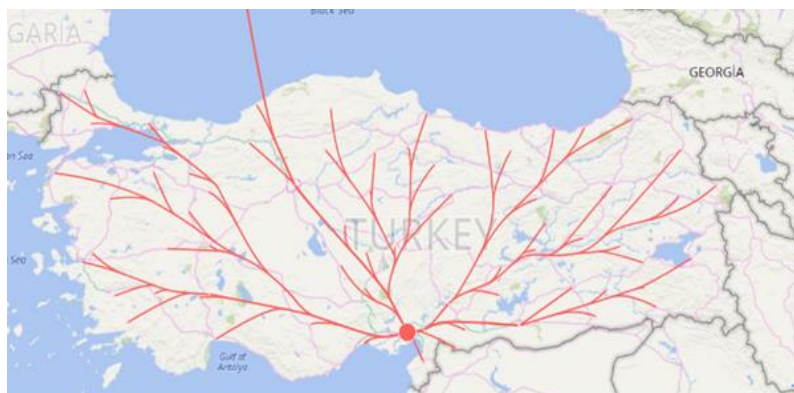
### Transformation

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



### 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

### 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 30 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.





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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