

**Title:**           **Supporting supply chain planning and scheduling decisions in the oil & chemical industry**

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In the downstream oil & chemical industry Planning and Scheduling are resource intensive, complex, rolling processes. Decisions are taken at different stages within the supply chain (Supply, Manufacturing & Distribution) and at different levels in the management hierarchy (Planning, Scheduling & Operations). They differ in business scope, time horizon & resolution, data certainty & accuracy, process detail and optimizing mechanism. Aligning each step of this complex process is critical to competitive advantage. Decision support tools must therefore be provided within a coherent framework. Including mechanisms which allow consistent economic and operational steering, taking due account of available (real-time) information on actual operations and market economics.

At the strategic and global planning level for a network of manufacturing plants, decisions have to be taken on feedstock procurement & distribution, utilization of production capacities, utilization of modes of transport and demand allocation. Not only existing capabilities have to be considered but also new opportunities in all areas have to be evaluated. The resulting Mathematical Programming model is a Mixed Integer Non-Linear Programming (MINLP) model: Integer aspects arise because of e.g. fixed costs / investment costs, tiered pricing and cargo costs. Non-linear relations are mainly caused by multiplication of quantity- and economic-variables. In the presentation, the various strategic planning problem areas, the contents of the MINLP aspects and the implemented solution approach will be further elaborated.

The use of such models during the aforementioned (strategic) decision taking process yields substantial benefits not only in economic terms but also in improved understanding of the interactions between the various components of the business.