Summary

Within Royal Dutch Shell, Rhine Supply is responsible for the transport of oil products within the Rhine envelope. The Rhine envelope consists of The Netherlands, Belgium, Luxembourg, Germany Switzerland and Austria. Primary Distribution is responsible for the transport of oil products from refinery to depot by Pipe, Barge, Rail or Truck. Secondary distribution is responsible for the transport from depot to retail station. This research concerns the optimisation of Shell Rhine Supply Primary Distribution in 2015 of the mean fuels: Mogas, AGO, IGO and Jet.

Every year Shell draws up a transport plan that states all planned primary transport to fulfil all demand. A study named Navigator predicts shifts in demand and supply for the Rhine envelope in 2015. The question has risen what Primary Distribution will look like in 2015. To answer this question a model is used, called NetSim. The NetSim model is used by Shell to optimise parts of Primary and Secondary Distribution. The design of spreadsheet tools and cases for the NetSim model have led to the possibility to create and optimise transport plans for the complete Rhine envelope, given the transport network, the supply and demand.

For this research a case has been designed for the 2007 transport network, to optimise the transport plan. The comparison of the 2007 transport plan and the optimised transport plan shows a possible cut in transport cost of nearly six million Euro (6,3%). This reduction in transport cost is due to 3,2% less transport and 3,2% lower average rates.

In order to answer the question what primary distribution will look like in 2015, a case for 2015 has been created based on the predicted supply and demand from the Navigator study. The case shows that the 2007 transport network is not able to supply all demand in 2015 because of a few bottlenecks. These bottlenecks are a lack of transport capacity in Pernis, Wesseling, Flörsheim, Ludwigshafen, Neustadt and Vohburg, and a lack of production capacity of Ago and Jet. Chosen is to increase production in Pernis. With these bottlenecks solved, it is now possible to supply the Rhine envelope against a 15,5% lower cost. In total, 12,2% less transport with on average 3,7% lower rates is needed to supply the decreased demand of 8,4%.

The Rhine envelope NetSim cases in combination with the analysing tools form a powerful model that, especially in a changing environment of supply, demand and transport tariffs, adds value to the planning and evaluation of Shell’s Primary Distribution transport plan and network.