

Summary

The Netherlands contains a fairly large density of pipeline systems transporting natural gas, crude oil and petrochemical products. After exploration of the Groningen gas field and the development of the port of Rotterdam, pipeline transport increased significantly. In the current worldwide focus on energy and environmental concern, the safe and low-polluting transport by pipeline is encouraged. This reports aims to illustrate the status quo of the pipelines in the Netherlands by focusing on their trajectories, transported commodities, technical characteristics, management, operation and costs.

The pipelines in the Netherlands have various functions, including: export of natural gas to adjacent countries, transport of natural gas to local networks for residential purposes, transport of natural gas to power plants, provision of refineries and industrial centers in the Netherlands and adjacent countries with crude oil and petrochemical products such as ethylene, gasoil, naphtha, propane, propylene and hydrogen. Furthermore, provision of civil and military airports in the Netherlands and other European countries with kerosene and provision of greenhouses with carbondioxide resulting from crude oil refining. Two routes are densely populated by crude oil and petrochemical product pipelines: the trajectory from the port of Rotterdam to Antwerp and the trajectory from the port of Rotterdam to the Ruhr area. Furthermore, the Netherlands is covered with a natural gas grid of approximately 13.000 km length.

In recent years, some projects have started to promote pipeline bundling and sharing between companies. This development leads to more efficient construction, operation and management of these pipelines resulting in lower construction and operating costs.

Generally, a pipeline is built, owned and management by a dedicated company, resulting from a joint venture between involved companies. Computer systems and communication media are indispensable for monitoring, operating and managing the pipeline system. The transportation of different commodities through the same pipeline and the transportation of commodities owned by different companies increases the complexity of pipeline operation and management significantly.

As the exposure of transported commodities to people and the environment is very dangerous, safety procedures concerning pipelines are very strict. As the focus on the environment increases, more and more strict policy is made. Governmental legislation on pipeline used to be in a deadlock for two decades but recently, measures have been taken and elaborated policy will be published shortly.

As also was the case for the technical characteristics of the pipelines in the Netherlands, cost information has been protected very securely by the companies involved. Consequently little information is available concerning construction and operating costs. From comparisons of actual cost estimates and theoretical models it appears that the pipeline system itself (i.e. pipes, fittings and pump stations) make up approximately 40-45% of actual natural gas pipeline systems. This implies, 55-60% of actual costs is made up by purchase of land, right-of-way acquisition, the construction of crossings with other infrastructure and the acquisition of legal permits. The construction costs for natural gas pipelines per m³ per km vary between EUR 4.000 and EUR 7.000. Furthermore, the pipeline diameter has a large influence on pipeline construction and operating costs.