

Oil and Gas Transportation

Oil and natural gas are only rarely found near the points at which they are consumed. The main oil and gas deposits are located in emerging or developing countries. Once domestic demand is met, these countries export most of their hydrocarbon production to industrialized regions. Europe, North America, and East Asia have strict energy requirements but are not self-sufficient enough in terms of oil and gas supplies. As a result, transportation of crude oil and its products as well as natural gas is a significant part of the cost buildup from initial exploration and discovery through to the final user.

For the world oil industry, there are four basic kinds of transportation. In rough order of importance, they are:

Tankers

Pipelines

Railroads

Tank cars and tank truck

Oil tankers are by a fairly wide margin the cheapest form of transportation on a barrels-per-kilometer basis, with pipelines second, railroad tank cars third, and tank trucks fourth. But which form of transport is technically or economically feasible depends mainly on geographic factors, such as the location of the markets to be served, the size of the market, and what kind of road or railroad facilities are available.

The choice of transportation facilities also depends partly on whether crude oil, natural gas, or oil products are involved. In general, it does not make much difference what kind of crude oil is put into a tanker or a pipeline, since the mixing of one type or another does not significantly affect the refining pattern to which the oil is subjected, but it can make a great deal of difference if oil products, which are often subject to very tight specifications, are mixed a great deal in their transportation systems. This means that product transportation systems have to be segregated to avoid contamination among the various products, which significantly affects the economics involved. With respect to natural gas, it is difficult to transport by tank trucks because of its low density, and it is expensive to transport by pipelines across oceans.