
New pipelines needed between Rotterdam, Chemelot and North Rhine-Westphalia for the energy transition

Vision Port of Rotterdam Authority

Summary

Sustainable energy and raw materials are vital for the energy transition and the transition to a circular economy. Northwest Europe consumes more energy than it can produce sustainably in the region.

That is particularly true of the large industrial clusters such as those in Rotterdam, Antwerp, Chemelot and North Rhine-Westphalia. They will need large-scale imports by sea, of hydrogen especially. Industrial areas that are not close to the coast can obtain new energy carriers and raw materials through pipelines.

Because of its geographical location, Rotterdam is already the most important port for supplying the Northwest European hinterland with fossil products. With the expansion of the existing pipeline infrastructure, particularly for the delivery of hydrogen and the removal of excess CO₂, Rotterdam will maintain that position in the long term and strengthen the local business climate.

Thanks to the Pipeline Structure Vision, a route is already available in the Netherlands for laying those pipelines between Rotterdam, Chemelot and the German border.

Industry has shown interest in the construction of new product pipelines. Laying different pipelines at the same time generates major cost savings. A rule of thumb is that you can lay three pipelines for the price of two.

New infrastructure

The strength of the Rotterdam port and industry cluster is largely determined by its location on the coast, the size and diversity of the industry located there, and the excellent connections with the hinterland (including Germany) through inland shipping, road, rail, and pipelines for oil/oil products and chemicals.

Every day, seven days a week, the equivalent of about 1,500 tanker trucks in crude oil alone passes through pipelines to German refineries. Transport by pipeline is quiet, safe and reliable. Operating costs are low.

Longer periods of low water on the major rivers mean that inland shipping is becoming less appealing for large quantities of cargo. The expected volumes of hydrogen (and hydrogen compounds such as ammonia) mean that switching to rail for weeks on end or maintaining large stocks are unappealing alternatives. Safety requirements for rail transport are strict and the road network is already congested.

Supply security, safety and costs are very important for industry and so pipelines are effectively the only serious alternative for supplying the industrial clusters of Chemelot and North Rhine-Westphalia with renewable energy and raw materials.

As a result of the energy transition, existing 'fossil' cargo flows will slowly but surely tail off or completely dry up in the coming decades, and new flows will also emerge. Crude oil and mineral oil products will disappear into the background. The chemical industry will continue to need raw materials but it will change to more C₂/C₃/C₄ feedstocks (ethane/propane/butane). Hydrogen will really take off as an energy carrier and as a raw material.

Rotterdam is a logical link in these new chains. Large-scale production facilities are expected to be established for blue and green hydrogen in Rotterdam in the years to come. Hydrogen will be imported for use in Rotterdam. That will

result in the storage and trading of hydrogen (and hydrogen compounds), making Rotterdam the natural choice as the central port for deliveries of hydrogen to the hinterland.

The same applies to CO₂, albeit in the opposite direction. Industry in Chemelot and North Rhine-Westphalia does not have access to CO₂ storage sites like those currently being developed in the Porthos project offshore Rotterdam. Connecting to that system will provide industry inland with the opportunity to contribute to the fulfilment of the climate objectives through CCS. It is possible that a CO₂ pipeline of this kind could eventually be used as an additional pipeline for hydrogen.

The current pipelines will be needed during the transition period to transport the fossil raw materials that are being used at present, and they will not therefore be available in time, if at all, for the new flows. In addition, large sections of the existing routes are unsuitable for the development of new pipelines.

However, the Netherlands has a 'Structuurvisie Buisleidingen'; a national spatial planning on pipelines that has set aside corridors for new pipeline infrastructure. The route of the new pipeline bundle between Rotterdam, Chemelot and North Rhine-Westphalia therefore follows the route set aside in these corridors.

Strengthening Rotterdam's role

New pipelines between Rotterdam on the one hand and Chemelot and North Rhine-Westphalia on the other will be needed by the inland industrial clusters to complete the transition to sustainable production processes.

This will not be possible without the import of hydrogen in particular. At the same time, a CO₂ pipeline from North Rhine-Westphalia and Chemelot to Rotterdam will help industry to contribute to the climate objectives.

New pipeline infrastructure will also strengthen Rotterdam's role as an industrial cluster and transit port.

It will ensure that Rotterdam, which currently has a strong position in an energy system based on fossil raw materials, will maintain that position in an economy based on sustainability. This cuts both ways.

Because the Netherlands has a spatial planning on pipelines ('Structuurvisie Buisleidingen'), it can lay new pipelines relatively easily by comparison with other countries. And the simultaneous installation of several pipelines will also reduce costs.

