



**i** The project will stimulate the petrochemical cluster in Antwerp and also boost the sustainability of the sector thanks to the technological upgrade.

# Port of Antwerp gets the most energy-efficient ethane cracker in Europe

**INEOS aims to contribute to the competitiveness and sustainability of our chemical sector by building an ethane cracker in the Port of Antwerp with the highest efficiency and lowest carbon emissions in Europe.** Author: Joris Hendrickx



**Nathalie Meert**  
COMMUNICATIONS & EXTERNAL RELATIONS MANAGER INEOS PROJECT ONE

## What does Project ONE entail, and what makes it so special?

With Project ONE, INEOS aims to build a new ethane cracker in the Port of Antwerp for the production of ethylene, one of the most widely used chemical compounds in the world.

Ethylene is present in countless everyday products, including cosmetics, fabrics, cases for computers and smartphones, domestic appliances, packaging to increase the shelf life of food, and medical supplies such as syringes, infusion equipment and... hand sanitiser. It is incorporated in durable products such as lightweight parts for vehicles and wind turbines, insulation materials for buildings, and pipes for transport of drinking water.

There is a growing worldwide demand for ethylene. Regions such as North America and China are responding to this with new investments. Europe has outdated production facilities and risks losing its market position. Project ONE aims to reverse this trend.

"Project ONE is revolutionary because the last investment of this size in the European chemical sector was no less than 25 years ago.

This amounts to a billion-euro investment that will stimulate the petrochemical cluster in Antwerp and also boost the sustainability of the sector thanks to the technological upgrade."

## How sustainable is this project?

The European and Flemish environmental and climate ambitions are high. With Project ONE, we are building a bridge to the future: by deploying the latest technologies, this plant will, remarkably, emit less than half as much CO<sub>2</sub> as comparable plants for the same production volume. In specific terms, if we compare the Project ONE ethane cracker with all other European crackers within the European Emission Trading System (ETS), we see that we are literally shifting the standard. In the steam crackers category, Project ONE emits 0.29 tonnes of CO<sub>2</sub> per tonne of product, putting it at 43% of the benchmark (0.68 tonnes). The benchmark is determined by the 10% best performing plants. Once our ethane cracker goes online, it will affect the benchmark, which will encourage other players to make additional sustainable investments or they will have to pay more for emission rights.

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## Will the investment also pass the test of more stringent climate objectives?

The route to a climate-neutral future runs in stages. Project ONE is already making a fundamental difference by making maximum use of the very best of what today's technology offers. **Customers supplied with ethylene from Project ONE can reduce their CO<sub>2</sub> emissions by 2 million tonnes per year because they are no longer dependent on ethylene from more polluting plants.** And our ambition reaches even further. We have incorporated flexibility into our plants to allow us to reduce our footprint further and integrate other technologies as soon as they are mature. For example, it is technologically possible to feed the cracking furnaces and steam generators of Project ONE entirely with hydrogen, provided that enough green hydrogen is available. With the investments currently being made in hydrogen technology, including in Flanders, it looks like this will be possible in future. Our design also has room for a carbon capture installation, so this option can also be utilised. ■

**INEOS**

Read more on  
[project-one.  
ineos.com/nl](http://project-one.ineos.com/nl)

## How do you succeed in doing so much better?

First of all, we use ethane as the feedstock. There are currently around 40 crackers in Europe for ethylene production. Most of them run on naphtha, a derivative of crude petroleum. A disadvantage of this, compared to ethane, is that it is less selective for ethylene because many other by-products are also formed in the process. We compared the complete life cycle of ethane with that of naphtha. We took into account production on the site as well as the preceding steps (e.g. naphtha refining and cooling of ethane during transport). The result shows that the ethane route is approximately 50% more sustainable than the naphtha route.

By using advanced technologies, we are additionally able to incorporate many efficiencies in our production system. For example, we use the hydrogen generated as a by-product of the chemical reaction as fuel for our furnaces and steam boilers. This considerably reduces our carbon footprint, since no carbon is released when hydrogen is burned. We make intelligent use of existing streams: the low temperature of the feedstocks and the high temperature of the furnaces are optimally integrated to keep the energy budget of the site in balance. Our electricity use is also met by renewable energy; for this we concluded two large wind power contracts with Engie and RWE last year.

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