

How did we calculate the amount of renewable diesel that can be produced from the emissions of TATA steel?

Explaining the numbers

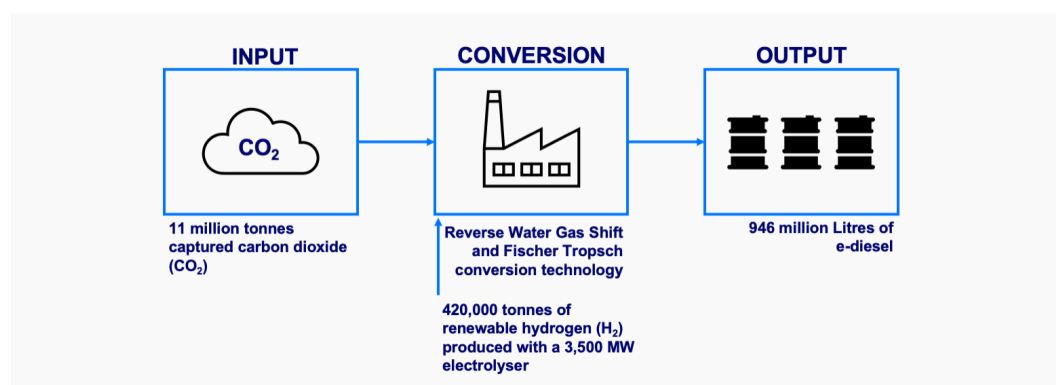


Figure 1: Schematic example of the amount of renewable diesel that can be produced based on the emissions from TATA Steel.

In the Netherlands, the company TATA Steel alone emits approximately 11 million tonnes of CO₂ per year.¹ What if these emissions were captured and combined with renewable hydrogen to produce an e-diesel for road transport?

To produce e-diesel, the CO₂ has to be converted to CO using the reversed water gas shift reaction (RWGS) and combined with hydrogen (H₂) to generate a syngas that can be further processed with a Fischer-Tropsch conversion technology (Figure 1).

Therefore, an additional 420,000 tonnes of renewable hydrogen is required. This is produced using a 3,500 MW electrolyser and an electricity input of 17,500 GWh (= 63 PJ). In total, this can lead to the production of 946 million litres of renewable e-diesel. This amount of e-diesel is enough to fuel 1.6 million cars in a year.

We calculate this based on an average consumption of new cars in the Netherlands of 5.35 litres per 100 kilometre (in 2023) and a typical distance that a car drives in the

¹ TATA Steel, Duurzaamheidsverslag 2022/2023
<https://www.tatasteelnederland.com/sites/default/files/tata-steel-duurzaamheidsverslag-2022-2023.pdf>

Netherlands per year which, is around 10,500 kilometres. This amount to an annual fuel consumption of 562 litres per year ($0.0535 \text{ [l/km]} \times 10,500 \text{ [km]}$).

The 946 million litres of e-diesel produced from the emissions of TATA can be used as a drop-in fuel and could power around 1.6 million cars ($1.6 \text{ million [l]} / 563 \text{ [l]}$).

Looking for opportunities in regions to increase investments in renewable fuel by reaching new groups

Significant investments are required for the scale-up of the necessary renewable fuels production to reach our climate targets.

As part of this campaign, we are looking for opportunities within regions, highlighting the renewable fuels volumes that can be produced when using locally available resources. Using the raw materials that are already there, for instance with the use of the emissions from TATA Steel, we want to show examples the possible renewable fuel production pathways.

By calling upon new groups, such as the investment community, we aim to emphasize that they can also participate in accelerating this production by investing in the green technologies.

