Life 'N Grab Hy

Clean cities, clean air with garbage trucks on hydrogen

Demonstration of a garbage truck on hydrogen in Eindhoven (the Netherlands)

April 2019 – Maart 2021

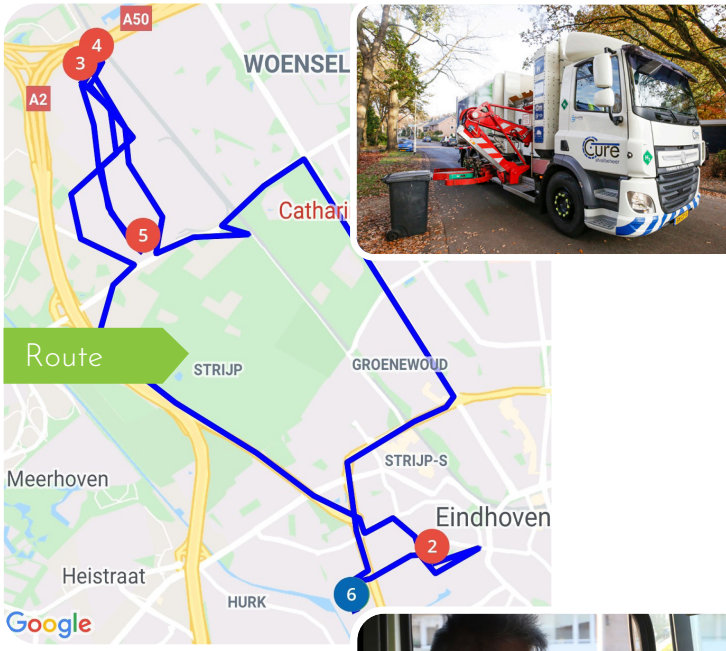
The truck is owned by waste collection company Cure

Results

An existing operational vehicle of Cure of 15 years old was overhauled and converted to hydrogen. The idea was to extend the usage and add another lifecycle by giving it a second life and upgrade it to the latest state of the art of propulsion and emissions. Although giving the a vehicle a second life in a circular way, not needing to produce another truck and saving raw materials, was inspired by ethical intentions, some drawbacks appeared. For example, the vehicle was collecting waste in an inner city operation: low mileage, low average speeds and high demand on the lifting device and the compactor. This combined with the fact that side-loader compactors have a relatively high energy demand, also meant that the vehicle (state of the art design in 2015) was underpowered and also showed limitations in acceleration on 80kph roads.

Nevertheless, a lot of lessons have been learned.

The vehicle drove **1.500 kms** during the **20 months** of operation. It collected multiple waste fractions such as residual, biomass, PMD in the inner city of Eindhoven in the South of the Netherlands. In total Cure operated the vehicle for **42 days**, with an **average route of 35 kms** in a regime of 2 to 3 out of 5 working days.



Route

Refuelling:

The truck refuelled **270 kg of green hydrogen** at the WaterstofNet refuelling station at the Automotive Campus in Helmond. It refuelled **20 times with an average of 14 kgs**. This was in line with the prognosed 1 refuel per 2 operational days, showing similar refuelling times as their diesel equivalent of about 13[1] minutes.

The electricity used for night-charging of the battery also comes from **green-electricity contract**. This means no CO_2 or other Greenhouse gases have been emitted while operating the hydrogen electric hybrid vehicle during the Life 'N Grab Hy! project.

[1] *This is the long year average, refuelling goes faster in winter than in summer.*

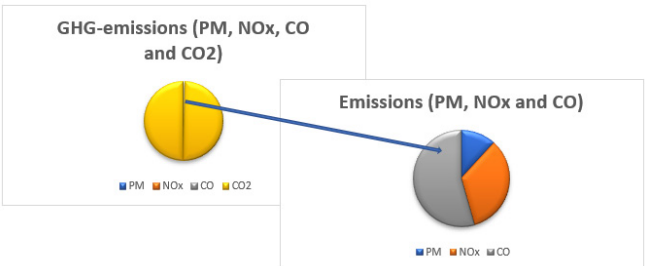
Comfort

Beside the green house gas emissions that were saved, the vehicle operated with lower noise. This remarkably enhanced the physical working conditions of the drivers and the loaders. Both were enthusiastic about the truck, having a more comfortable ride due to less vibrations and low noise levels. At the same time the truck was emitting less noise to the environment, creating less environmental sound pollution.

Impact

Green house gases saved:

GHG-Emissions[2]			
PM	**NOx**	**CO**	**CO2**
2.4 kgs	7 kgs	10,5 kgs	5,1 Tons



[2] *kgs of GHG saved compared to EURO 3 Diesel (compared to 2014 at project start)*