Recycled Carbon Fuels producer, LanzaTech is pleased to comment on the proposed changes in the Netherlands Wet Milieubeheer, necessary to implement the revised European Renewable Energy Directive and agreements made in the Netherlands Climate Agreement, for the transport and mobility sector.

LanzaTech is pioneering the commercialization of a complete process platform to allow the continuous production of sustainable fuels and an array of chemical intermediates from waste gases at scale. Using a proprietary biological conversion technique known as gas fermentation, the LanzaTech process leverages local, abundant, low-cost waste resources as feedstocks. The technology has been successfully demonstrated using a diverse range of feedstocks composed of carbon monoxide (CO), hydrogen (H_2), carbon dioxide (CO_2), or biomethane (CH_4), including waste gases from industrial sources (e.g., steel mills, or refineries), syngas generated from any resource (e.g. unsorted and unrecyclable municipal solid waste (MSW) or agricultural waste), or biogas. When using waste gases from industrial sources or syngas from unrecyclable non-biogenic MSW, the resulting fuels fall under the category of "Recycled Carbon Fuels" (brandstoffen van hergebruikte koolstof). This contrasts with "better fossil" fuels, like LPG, LNG and CNG which continue to use fresh fossil resources as a feedstock.

The first commercial plant demonstrating fuel ethanol production from unavoidable gas residues produced by the steel industry was commissioned in China in May 2018. To date this plant has produced over 45M liters of low carbon ethanol from a waste stream from steel making, the equivalent of mitigating over 60,000MT of CO_2. Further commercial plants are in design or under construction globally.

LanzaTech is pleased to see that recycled carbon fuels (brandstoffen van hergebruikte koolstof) have been included as an option for the generation of Greenhouse gas reduction units (Broeikasgasreductie-eeenheden - BKEs) and should it prove useful, LanzaTech is very willing to provide detailed information produced by independent 3rd parties about the carbon balance of our process and fuels.

Recycled carbon fuels capture and reuse waste emissions that are too dilute for Carbon Capture and Storage (CCS) and usually burned for power at low efficiency (< 40%) or flared. By using waste streams, recycled carbon fuels avoid combustion and, at facilities where power is produced, divert carbon-based power from the electricity grid, creating additional demand for electricity from other sources, which are increasingly renewable. Approximately 85% of new EU power generation capacity came from renewable sources in 2017[1]. As a result, recycled carbon fuels reduce transport emissions with only a modest increase in electricity generation emissions, which will drop over time as the electricity grid is decarbonized in line with policy targets.

While we fully support all solutions, and believe they will contribute to a low carbon future, we believe the BKE-system should remain focused on accelerating adoption of new approaches that reduce greenhouse emissions while avoiding use of fresh fossil resources. In

[1] https://windeurope.org/wp-content/uploads/files/about-wind/statistics/WindEurope-Annual-Statistics-2017.pdf

our view, incentives such as BKEs should be reserved to support deployment of new carbon reduction technologies, such as recycled carbon fuels and advanced biofuels, that contribute to the objective of full decarbonization of transport. BKEs can create a more level playing field in the Netherlands for new decarbonization technologies that must compete with well-funded fossil incumbents even as they are scaling and beginning broader build out. The value of a BKE would help to offset any initial cost differential for new fuel pathways relative to fossil fuels. Awarding BKEs to fuels from virgin fossil sources, even those with lower-than-average GHG emissions, will have the undesired consequence of perpetuating the use of virgin fossil resources, instead of “leaving them in the ground”.

Given the ambitions in the Climate Agreement to significantly reduce the climate impact in all economic sectors, and the transport sector in particular, it is key to reduce the extraction of virgin fossil resources for the transport system and replace them by waste-based approaches, advanced biofuels, and other sustainable fuels.