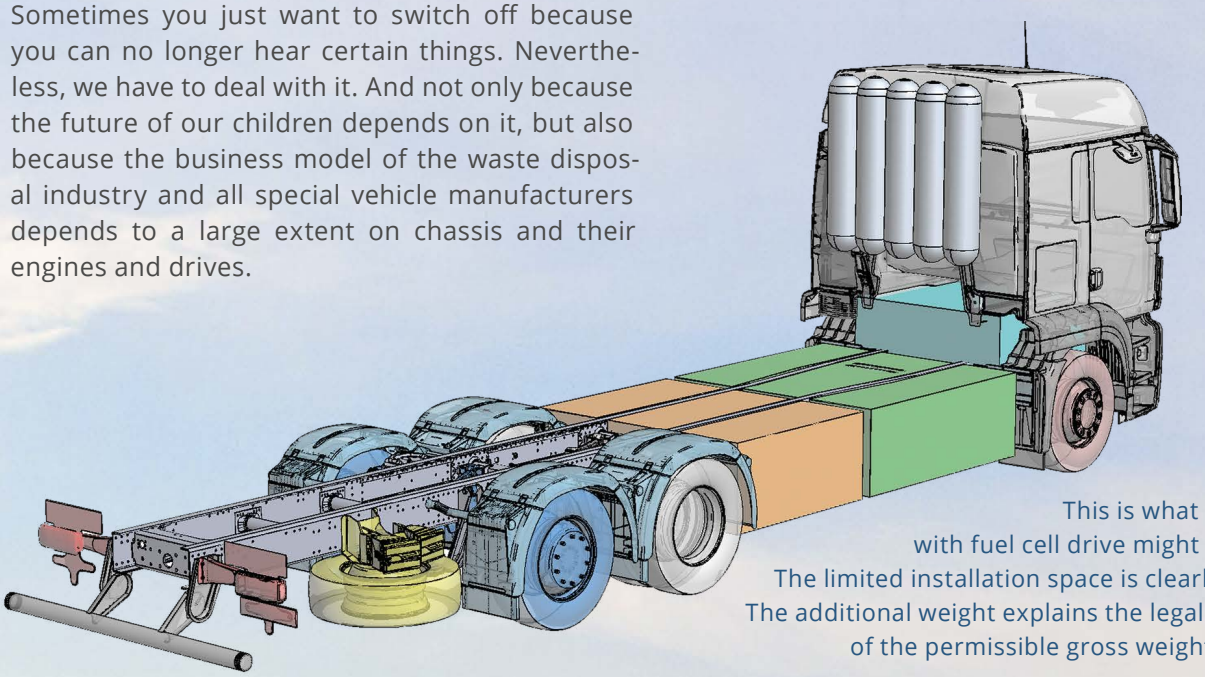
ALTERNATIVE POWERTRAINS:
Who owns the future of the truck?

The number of publications about the future of the truck and its possible engine and drive variants in trade journals, the Internet, etc. is almost unmanageable. At the same time, new reports from politics, society and the economy about the upcoming climate change and who is emitting how much CO2 are creating increasing unrest, which is also leaving its mark on our industry.

Sometimes you just want to switch off because you can no longer hear certain things. Nevertheless, we have to deal with it. And not only because the future of our children depends on it, but also because the business model of the waste disposal industry and all special vehicle manufacturers depends to a large extent on chassis and their engines and drives.

In all the discussions currently being held by experts, two electric drives in particular are expected to replace the diesel engine: the battery and the hydrogen drive. The world's leading commercial vehicle manufacturers are expecting a transformation of Europe towards an electric and hydrogen economy, which is why the question of how to drive a sewer cleaning vehicle is one of the most important issues for our industry.



This is what a chassis with fuel cell drive might look like. The limited installation space is clearly visible. The additional weight explains the legal increase of the permissible gross weight by 10%.

The share of the traffic and transport sector in CO2 emissions is immense. In the EU alone, the share is around 25% of total CO2 emissions. Of this, commercial vehicles account for between 25 and 30%, and the trend is still rising. Therefore, according to current political decisions, it can be assumed that the diesel truck will disappear from our streetscape and the sewer after more than a century of dominance.

The efficiencies of the various drive systems vary considerably in some cases. VW puts it very graphically as follows: A Golf Diesel consumes six liters per 100 kilometers.

This corresponds to an energy consumption of 60 kilowatt hours. This gives an e-Golf a range of 400 kilometers. This shows that the internal combustion engine and the electric drive are basically two completely different drive systems, one of which consumes three to four times as much energy. Against this background, an electric drive therefore clearly makes sense.

However, with the good old combustion engine, we have a fuel tank that enables us to drive over a longer distance and to work trouble-free with the self-driving working machine „sewer cleaning vehicle“. With the electric drive, however, the question of energy storage remains open and is still the subject of intense debate.

Experts consider the battery to be the most technically mature solution at the present time. Significant progress has been made in recent years, particularly with regard to the important challenges of range and charging time. Real ranges of up to 500 kilometers and more and charging times of 20 to 30 minutes for 80 percent battery capacity using superchargers are possible.

Unanswered questions in the field of special-purpose vehicles remain, due to hardly any experience, regarding repeated call-up of maximum power, thermal management, weight, availability of space on the superstructure, etc. These are enormously important criteria for any self-driving working machine.

Nevertheless, these do not necessarily have to be knock-out criteria for electric drives in the long term. However, it will certainly be some years before chassis manufacturers will also deal with such issues in niche industries such as the municipal sector.

The biggest challenge that can be identified at the moment, apart from the lack of clarity about costs, economic operation and the possible applications of future vehicles, will be the insufficient infrastructure. This applies both to the interurban road network, especially the highways, and to urban areas.

Considering that it is often extremely difficult to find a parking space in large cities, the question arises as to what a functioning charging infrastructure could look like and how often users will be expected to interrupt their work for the purpose of charging when operating sewer cleaning vehicles. Furthermore, the question arises as to how the charging infrastructure will be financed.

A technically interesting alternative to the battery as a storage device is the „on-board“ generation of electricity from hydrogen using fuel cells. This variant is CO2-neutral if hydrogen is generated from renewable electricity by means of electrolysis.

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However, experts have identified a loss of efficiency here by a factor of two. Today, the system efficiency of a fuel cell drive is less than 40 percent. In addition to the question of the robustness of the fuel cell, major obstacles include the still enormously high production costs, which make it extremely difficult to introduce such systems in special commercial vehicles for series production.

In addition, technical modifications will have to be made to the bodies of municipal vehicles, for which hardly any quantifiable experience is yet available. Enormous cost increases can certainly be expected here.

A hydrogen-powered refuse collection vehicle from Germany currently available on the market is offered at four times the price of a comparable conventional refuse collection vehicle from the same manufacturer. It should therefore be clear that every waste disposal company will have to completely redefine the word “economic efficiency of a waste disposal vehicle”.

In any case, it seems foreseeable that significant price increases for conventional waste disposal services will be the result. The biggest hurdle, however, is likely to be that a completely new infrastructure will have to be built for the use of special commercial vehicles powered by hydrogen.

In Germany, there are currently still around 14,000 conventional filling stations and currently around 60 publicly accessible H2 filling stations. The cost of building a hydrogen filling station depends very much on the capacity and runs into the millions per filling station.

In addition to the e-truck and the hydrogen truck, some well-known manufacturers are giving another option a chance in trucking and especially in long-distance transport. With this so-called third option, synthetic fuels, the energy required for production is relatively high. However, synthetic fuels also make a good contribution to climate protection, as they are virtually emission-free.

The existing fleet of commercial vehicles amounts to three million worldwide. They will not disappear by 2030/2040. Synthetic fuels can be the key here to operating existing vehicles sustainably. The above comments make it clear that mastering the drive turnaround will be a very big challenge for our industry. However, Corona and the resulting consequences for the supply chains are currently making it abundantly clear that the drive turnaround will not be the only one, which is why we are promoting openness to technology.

It will be the market, not politics, that decides what prevails. But no alternative drive system can do without an appropriate refueling and charging infrastructure. Germany must make considerable efforts here to expand the networks.

No one in the globally respected German waste management industry wants negative examples such as Berlin’s BER airport to be repeated throughout Germany and established, functioning and, above all, tax-paying sectors of the economy to be endangered or even threatened in their existence.

Author: Dr. Volkwin Müller

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