Climate neutral mobility

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Abstract

Quote from: ‘Natural Gas and Renewable Methane for Powertrains’ Future Strategies for a Climate-Neutral Mobility

“An element in the action plan to achieve the global 2-degree goal is that transportation at least massively limits the growth in its greenhouse gas emissions or rather contributes significantly to a reduction in emissions. This is necessary on both a national and a global level. The whole world is experiencing a massive surge in the growth of the volume of traffic: all forecasts point to further growth. It is therefore a problem of global proportions for which an exclusively national view is insufficient. Apart from the different boundary conditions in the various regions, it must be noted that the different transportation platforms have different growth and have different potential and options for the reduction of greenhouse gases. Forecasts assume that the GHG emissions due to transportation will more than double by 2050, from 6 $GtCO_{2,eq}$ to 14 $GtCO_{2,eq}$.

Since economic growth and traffic growth are coupled in many countries, steps to drastically reduce the volume of traffic or to reduce its growth are politically difficult to impose. The conclusion is that it is highly probable that only minor successes can be achieved in this area. It appears that the key to the traffic-based climate issue lies in the domain of traffic energy supply.

There are a variety of options available for the different transportation platforms: The direct use of electricity based on renewable energy is practicable. The current level of knowledge states that there are no short or medium term globally available options for the direct use of electricity for heavy-duty traffic, shipping or aviation. However it must be mentioned that the direct use of electricity in commercial vehicles is in its infancy. Since the greenhouse gas emissions from the traffic sector from a global perspective are currently still increasing, the pressure to act and solve issues in traffic is growing rapidly. It is therefore high time to develop strategies to make technologies and energy carriers available for the transportation sector and if possible other sectors too that have no negative impact on the climate.

An important element in such a strategy is, according the wisdom of today, the production of synthetic methane utilizing electricity. This affects the purely technological availability of production and its future development. It can be the basis for a climate-neutral energy supply for transportation, where for example direct use of electricity (rail, passenger car, light-duty trucks) is not possible. Without a massive increase in the development of renewable electricity supply up to the time corridor 2050-2070, this technology, as a contribution towards climate protection, is however not very practicable. In parallel to this important initiative, the basis of every action in the

transport sector is to significantly reduce the specific energy consumption of each individual traffic platform to dampen the growth of transportation effort.

The use of synthetic methane is practicable in view of the already widely available infrastructure.

Natural gas has the potential of reducing the CO2 emissions in traffic due to its physical properties (C / H ratio): It increases the efficiency of Otto engines since higher compression ratios are possible; methane can also be produced synthetically. Natural gas represents a step towards greenhouse gas neutral transportation. The next step would be the fastest possible formulation of a globally effective strategy for the industrial production and use of electricity-based fuels from renewable energy sources (for example PtG-methane) and the direct use of electrical energy in the transportation sector. At the same time, directed further development of the technical processes needs to be initiated, unless other more realistic methods can be found how to achieve the 2-degree goal without having to use electricity-based fuels."

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