VDA | Verband der Automobilindustrie

Position

VDA's position on a European hydrogen strategy, sector integration and the upcoming revision of the RED II directive

The German automotive industry is committed to the climate targets set out in the Paris Agreement.

The automotive industry is committed to establish a greenhouse-gas-neutral transportation system by the middle of the century. All stakeholders agree that these ambitious climate targets can only be attained if, in addition to **electric mobility using green electricity, sustainable, renewable fuels** are comprehensively deployed in the transport sector, as studies have proven[1]. Electric mobility is the key driver to achieve the CO_2 targets in the transport sector –as determined in the current fleet target values until 2030. Broad, customer-oriented expansion of the charging infrastructure is urgently needed to enable the market ramp-up of electric mobility. The current discussion about **European hydrogen as well as sector integration strategies** is an important first step towards the support needed for a fast technology ramp-up. However, it is right that the governments should support research projects, but the best project support will not bring any benefit if there is no demand for the products on the market. The current considerations and national drafts neither prioritize the measures nor contains proposals for immediately accessible target markets – in the light of the very ambitious climate targets, road traffic should become a driver of sector integration and, therefore, a hydrogen economy.

Create the conditions necessary for hydrogen market ramp-up now!

The EU Effort Sharing Decision sets annual binding climate targets with specific CO_2 limits for each member state. For example, for the German transport sector, emissions of 150 million t CO_2 are already prescribed for 2020 – a reduction of nearly 13 million t in one year. This means that the German Government has approved an exceptionally ambitious climate target. The major CO_2 emissions in the transport sector are determined by the number of vehicles, the distances traveled, the energy consumption and the carbon content of the fuel used. The Automotive Industry is committed to Climate Change through technology and innovation. The faster new technologies to minimize the carbon impact of transport hit the market, the less thought must be given to other measures such as demanding pricing policies or traffic restrictions. Linear reduction targets contradict known ramp-up curves for new technologies.

The European Green Deal offers the unique opportunity to create the framework necessary for a fast ramp-up of alternative fuels. **The VDA therefore recommends developing a coherent sector integration strategy, which should address all necessary political changes, making the European hydrogen strategy as ambitious as possible, bringing ecological components into the energy taxation and revising the Renewable Energy Directive (RED II) swiftly and ambitiously** – so that sustainable, renewable fuels will be ramped-up extensively and starting off quickly.

[1] e.g.: dena/LBST: „The potential of electricity based fuels for low emission transport in the EU" (2017)

Electric mobility, hydrogen and E-Fuels are partners!

Depending on the specific use-case of people´s mobility needs as well as the local availability of green energy, different drivetrain concepts have particular Pro´s and Con´s in terms of ecologic potential, economic opportunity and sheer applicability.
Battery electric cars have a superior energy efficiency, they are ideal in circumstances where renewable electricity is abundant, and the requirements for energy demand and range are moderate. This is a superb solution for urban surroundings and smaller as well as lighter vehicles. Drivetrain concepts relying on hydrogen as a source of energy (either fuel-cell electric vehicles or internal combustion engines with electricity-based fuels (E-Fuels)) are advantageous for higher loads and ranges (e.g. long-distance driving on motorways or for heavy-duty vehicles). They also allow for the benefit of not being dependent on the spatial and temporal availability of green electricity as well as sparsely populated areas within the European Union, in which a massive expansion of a charging network is economically not feasible.

These different concepts therefore are not “rivals”. They both have their specific role to play on the way to a climate neutral transport system. The attainment of the EU’s ambitious climate goals with only one of these technologies will not be possible without substantially curbing mobility.
Today, the rapid ramp-up of electric mobility is substantially being driven forward by a wide variety of governmental measures and investments from the automotive industry. The VDA is working hard to push this even further. **However, renewable fuels are the only option to defossilize the existing car fleet** and thus to achieve immediate reductions in CO_2 emissions from road traffic. In the long-term, they are inescapable to reach climate neutrality in the transport sector.

Carbon pricing as a key driver of change in road traffic!

It is often argued that hydrogen and E-Fuels should be deployed primarily in the energy-intensive industry, aviation and shipping sectors and should not be used in road traffic. This argument seems manifest for the reason that the named applications have no other option to defossilize. However, it disregards the fact that **high CO_2 avoidance costs in road traffic represent by far the best driver to increase the demand for these fuels and thereby cut down the price**[2]. Currently, road transport is the only sector, in which willingness to pay is able to spark the uptake of hydrogen technologies. A massive price crash is needed, so that other sectors can afford the introduction of climate neutral fuels. Road transport has a sound potential to roll-out significant production capacity: Every long-distance truck running on hydrogen will need approx. 10 tonnes of hydrogen per year. Furthermore, the European CO_2 Regulation puts considerable pressure on vehicle manufacturers to sell considerable numbers of carbon-neutral vehicles. The regulatory measures explained below could kick-start economic opportunities for the market.

Seize the opportunities in industrial policy!

Advanced biofuels and E-Fuels can be used in the **existing infrastructure** that currently serves conventional fuels. Large amounts of hydrogen are currently used in refineries. A blending of green hydrogen from renewable electricity would have major impact on CO_2 emissions. According to a study by the German Economic Institute (Institut der deutschen Wirtschaft), the construction of a relevant number of production plants for E-Fuels could create approx. **500,000 jobs, most of them highly qualified positions,** by 2050 in Germany alone.[3] World leading manufacturers of electrolyzers are also located in Belgium, France, and the UK, among others. This is independent of the question of where these fuels will be produced in the future.

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[2] The biggest driver are economies of scale: a decline of prices comparable to the one in photovoltaics ten years ago can be expected

[3] Perner et al. (2018) - Synthetische Energieträger–Perspektiven für die deutsche Wirtschaft und den internationalen Handel

What are relevant sustainable, renewable fuels?

The VDA definition of relevant renewable fuels encompasses advanced biofuels (pursuant to RED II annex 9 Part A + B), green hydrogen and E-Fuels. Hydrogen and E-Fuels are produced from 100 percent renewable electricity, water (electrolysis) and CO_2. In this type of production, fuels complying with the Fuel Quality Directives can be manufactured using Power-to-X (PtX) technology. So all E-Fuels are based on renewable electricity and therefore on renewable hydrogen. A very ambitious further expansion of renewable energy (either generated domestically or imported) is therefore urgently required. In addition, the European hydrogen infrastructure needs a massive ramp up in order to allow for market driven direct deployment of renewable hydrogen in vehicles. Liquid or compressed hydrogen and E-Fuels offer huge opportunities for climate-neutral long-distance traffic due to their volumetric energy density. E-Fuels are climate-neutral because during production they remove exactly the same quantity of CO_2 from the air as they release when the fuels are used in vehicles and can achieve beneficial effects in the existing fleet.

The German National Platform Future of Mobility projects **production costs of 1 euro to 2 euros per liter in 2030**.[4] These costs already take account of the efficiency losses inherent in the production. The efficiency losses are irrelevant if the utilization of renewable energy is regarded in a global context: Photovoltaic systems and wind farms at suitable sites have a utilization rate that is two to four times better than that in central Europe. Also, the production of E-Fuels in southern Europe could bear a unique economic opportunity for trade within the union. Sustainable, renewable biofuels from residues and waste materials, which therefore do not compete with agricultural areas, should also be promoted. RED II correctly limits conventional biofuels to a maximum of 7 percent, thus definitively excluding the further expansion of palm oil production.

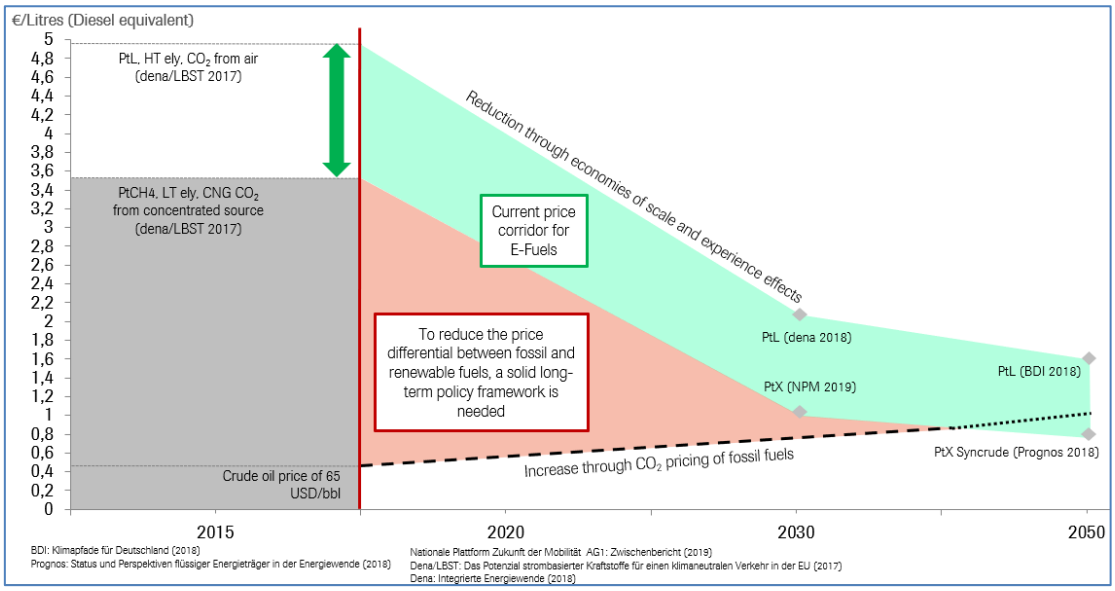

Figure 1: Cost corridor of E-Fuels according to different studies

[4] NPM (2019) - Wege zur Erreichung der Klimaziele 2030 im Verkehrssektor

Is sufficient renewable energy available for electricity, hydrogen and E-Fuels in road traffic?

The fastest possible expansion of renewable energy is an important element in any strategy for a climate-neutral transport sector. By using excess electricity to produce hydrogen, PtX technology functions as power storage that supports sector coupling. Owing also to the (long-term) limited availability of renewable energy production in Europe, a molecular source of energy is an important component in the security of supply. Such sources of energy will therefore very quickly be traded from sunny or windy regions within the European Union, or will be imported, because as a rule it is more economical to produce hydrogen and E-Fuels in regions where it is much cheaper to generate electricity. Many potential generation areas (e.g. North Africa, South America, the Middle East) are ready to start. This aspect should be mentioned in any hydrogen strategy. **The great advantage of hydrogen and E-Fuels is that so far they represent the only option for storing large quantities of renewable energy and transporting them over long distances**. Here there is the potential for synergies between climate policy and development aid. Therefore, we welcome the proposal of 2 x 40 GW installed capacity until 2030.[5] 40 GW in the Union, which would boost European hydrogen economy, and 40 GW imported, which are meaningful investments in developing countries.

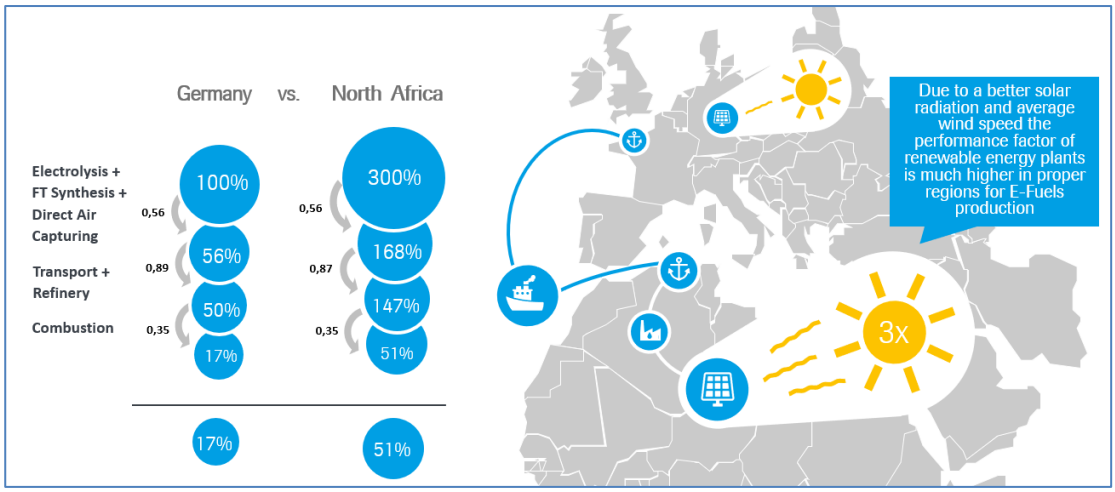

Figure 2: The efficiency of hydrogen and E-Fuels in relation to the place of production

Further, to kick off these investments the right regulatory conditions will be needed that create a lasting market demand (e.g. minimum quota of 5 % in RED II). Hydrogen and E-Fuels must fulfill clear **sustainability criteria** defined in the delegated acts of RED II (article 25 and 27). It is absolutely essential to prioritize this topic in a European hydrogen strategy.

How much CO_2 reduction do biofuels, hydrogen and E-Fuels achieve?

The CO_2 reduction potential offered by hydrogen and E-Fuels depends largely on the electricity mix used in their production. If these fuels are produced in regions inside or outside the Union, where renewable energy is cheap and abundant the use of surplus green electricity which could otherwise not be used, is a real benefit to the environment. In addition, in RED II the EU prescribes 70 percent reduction in CO_2. The delegated acts should mandate the use of electricity taking into account its origin, additionality and geographical and temporal correlation (Article 27). This means that a method is currently being developed so that the production of hydrogen and E-Fuels will use renewable energy only. **The VDA supports any measure that guarantees the exclusive use of renewable sources of energy for the production of E-Fuels**. The assumption found in some studies, that hydrogen or E-Fuels will be produced based on the national electricity mix, is therefore contrary to the EU's own regulatory requirements and does not make economic sense, as the costs of electricity from fossil fuels is much too high for any profit-oriented producer.

We mainly identify the following necessary measures in a European hydrogen strategy:

[5] Van Wijk and Chatzimarkakis (2020) - Green Hydrogen for a European Green Deal A 2x40 GW Initiative

What has to be done now?

- Exemption from energy tax for renewable energy carriers in the revision of the **European Energy Taxation Directive,**
- A targeted European **PtX market introduction program** for all sectors with 2 x 40 GW of installed capacity by 2030,
- Implementation of more ambitious targets: at least **23 percent renewable fuels** in 2030 without multipliers under RED II,
- Introduction of a **minimum quota of 5 percent for E-Fuels (including hydrogen)** in 2030 under RED II,
- Allowance to the member state to **reduce power taxes and surcharges** for hydrogen production according to the sustainability criteria defined in the delegated acts,
- **Preparation of proposals for the delegated acts** "Definition of obtaining electricity from a grid" (Article 27) and the "CO_2 performance of recycled carbon fuels" (Article 25) in the second half of 2020.

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