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Designing Sustainable Mobility

Mobility secures our economic success through growth and employment. Mobility also conveys a sense of freedom, thus making a major contribution to our quality of life. Until today, we have always owed this mobility to fossil fuels, internal combustion engines and turbines that power vehicles, ships and aircraft. Alternative energy sources and drive systems merely play a subordinate role in our current mobility system.

Last December, air quality and increased global warming were the key issues at the UN Climate Change Conference in Paris. The outcome of the conference will further advance the change in social values and will influence legislation on CO₂ and pollutant emissions. Our mobility system must change. We therefore require an all-encompassing approach for passenger car and commercial vehicle transport.

The electrification of passenger car traffic alone is too simplistic. The supply of electricity from the existing power grid is not sustainable. Electric mobility does not make sense unless the electricity is generated from regenerative sources of energy. However, generating electricity from wind or solar power is dependent on the weather and is therefore not stable. Variations in natural conditions can result in unacceptable voltage fluctuations in the power grid. For that reason, a special role is played by the reliability of highly flexible loads and

storage systems. With their grid-relevant properties, electric vehicles could act as controllable power loads and storage systems that will help to stabilise future power networks. This interaction between the vehicle and the infrastructure is one means of leveraging successful electric mobility.

One problem that is still unresolved is that of driving range. It is impeding the wide-scale market introduction of electric vehicles. The energy density of fuels makes them superior to all of the electric storage technologies currently available. Fuels must therefore continue to secure long-distance and heavy-load mobility. This means that the production of fuels from CO₂, water and regenerative sources of electric energy will be increasingly important. CO₂ remains part of the cycle. To achieve CO₂-neutral transportation, synthetic fuels must make the leap from the laboratory to the road.

Both approaches together are components of the type of sustainable mobility that ATZlive would like to be involved in shaping. With our new conference Grid Integration of Electric Mobility, we will be providing a national and international discussion forum for the automotive industry, energy providers, data services and politicians on 30 May and 1 June. A special strand of lectures at our Engine Congress in Baden-Baden at the end of February will support the development of CO₂-neutral fuels.