No Alternative

Dear Reader,

If German and other European politicians are to be believed, electric cars are the only cure for all our CO₂ problems. Apart from the fact that their attitude puts an end to any possibility of using other essential solutions such as hydrogen and e-fuels, it is well worth taking a look at the actual CO₂ footprint of electric cars in order to understand them properly. Christian Hanisch, Engineer at the company No Canary, recently published on LinkedIn an interesting summary on this subject. According to his calculations and the information in the 2019 Tesla Impact Report, the production of the Model 3 has a Global Warming Potential (GWP) of 11 t of CO₂ equivalent. This results in a greenhouse potential of 5200 kg of CO₂e per battery pack. In the case of a 50-kWh battery, this gives a GWP of 117 kg CO₂e/kWh. Tesla says that customers will be able to cover 12,000 km every year for 17 years in a Model 3. This is unlikely to be achieved with one single battery pack.

The emissions from production at Volkswagen have improved since the e-Golf. For the ID.3 Pro Performance, they amount to approximately 12.7 t CO₂, which corresponds to 5500 kg CO₂e per battery and 95 kg CO₂e/kWh. According to Hanisch, this represents "a huge improvement." No Canary has calculated the CO₂ footprint of the electricity generation for the BMW i3 by multiplying the consumption of 0.131 kWh/km over a distance of 150,000 km by the CO₂ footprint of the EU energy mix from 2010 of 0.3469 kg CO₂/kWh. The result is a figure of 6816.59 kg CO₂e for the use phase. As the electricity generation makes up 40 % of the entire life cycle of the GWP, according to No Canary 100 % of the i3's GWP is about 17 t CO₂. "Since BMW says that the production makes up 57 %, the CO₂ footprint of the production of the BMW i3 appears to be 9714 kg CO₂e,"

said Hanisch. An environmental assessment by Daimler shows a greenhouse gas potential for the production of the EQC 400 4Matic of 16,400 kg CO₂e. This indicates that around half of the emissions are caused by the battery, which would give a GWP of approximately 8200 kg CO₂e and 103 kg CO₂e/kWh.

Hanisch concludes that the manufacturers have made significant improvements and Tesla, in particular, is already a long way toward achieving its goal, but "we need to become climate-neutral very soon." What does this tell us? Firstly, that electric cars do not (yet) come anywhere near making the positive contribution that is often claimed. Secondly, that cars with fuel cell powertrains or hybrid drives running on hydrogen or e-fuels come out well from the comparison with electric cars. This makes it clear that there is no alternative to a both/and approach to powertrains, from any technical point of view.

I hope you enjoy this issue of ATZ.

Dr. Alexander Heintzel
Editor in Chief

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