

Explaining Things Better

A recent study conducted by the CAR Center of the University of Duisburg-Essen concludes that the weight of electric vehicles does not significantly impact on their range. The test cars used by scientists were a BMW i3 and the Tesla Model S, and their energy requirements under different loads were determined. For both vehicles, results showed that a payload of up to 300 kg had only a minor impact on energy consumption. They put this down to the phenomenon of recuperation, i.e. despite the fact accelerating a heavy mass requires more energy, braking of the same mass channels a comparatively high amount of energy back into the battery. According to the study, recuperation therefore makes lightweight design superfluous in electromobility, or at least no longer a top priority. So the steel industry has cause for celebration, and it's the turn of the fiber composite industry to worry. Moreover, the key argument for lightweight design – namely increasing the range of electric cars – may even be rendered invalid given these results.

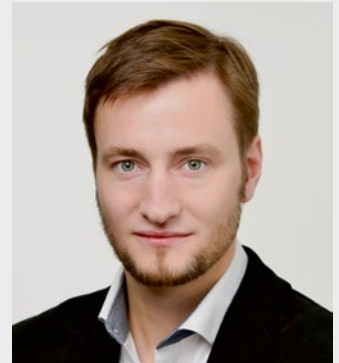
We are at the beginning of a debate, which – in principle – I welcome. The trigger for such debate is always a contradictory hypothesis. Experts are already questioning the findings of the study – after all, moving a heavy

object requires more energy than moving a lightweight object. Recuperation only allows for part of the energy previously used for acceleration to be recovered. In addition, frictional losses, such as rolling friction, are highly mass-dependent.

There may still be scope to dispel such doubts if the authors of the study revealed their approach. Unfortunately, this is where the debate ends: Since the study was commissioned by a private company, it is not publicly accessible, nor can the results be verified.

Therefore, somewhat inevitably, the study opens itself to the accusation of having produced results in the interests of its client. As all scientists know, skillful test arrangements can elicit almost any desired results. The example of the CAR study shows that information about the driving cycle used – which is crucial to understanding the results – is unknown. Which accelerations were applied, which speed levels? What is the absolute energy requirement of the light i3 compared to the heavy Model S? And who is the client?

Anyone who puts forward a hypothesis should justify it in the course of the debate. Anyone failing to do so is not enlightening anyone, merely leaving them unsure. ◀



Thomas Siebel

Responsible Editor
thomas.siebel@springernature.com