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V-OPT INVESTIGATOR - ASSISTANT FOR THE VEHICLE-SPECIFIC DETERMINATION OF THE RANGE MAXIMUM SPEED

Axel Unger
Bertrandt Ingenieurbüro GmbH

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V-OPT INVESTIGATOR - ASSISTANT FOR THE VEHICLE-SPECIFIC DETERMINATION OF THE RANGE MAXIMUM SPEED

Initial situation:

There is still a lot of focus on the issue of range in BEVs, which always leads to range anxiety.

Disadvantage:

A technically inexperienced customer is not aware of many interrelationships that influence his range. In addition to the classic consumers such as air conditioning or seat heating, the speed at which the vehicle is driven is a significant factor influencing the range.

There is no information in front of the customer "If you drive constantly at x km/h, your vehicle is the most efficient and you will therefore achieve the maximum range!"

Solution:

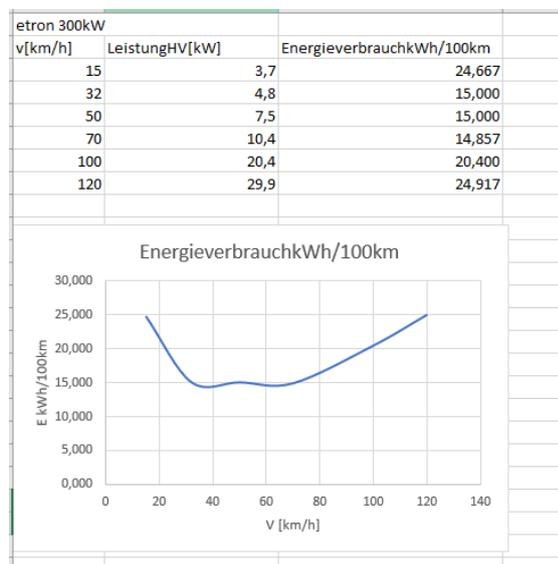
Wizard to determine the vehicle-specific v-OPT (=constant driving speed with the minimum consumption per 100km). Like every drivetrain, a BEV also has an optimal operating point at which consumption per 100km is lowest. Contrary to what may be assumed, this is not at low speeds. Although many components of the vehicle and influences of the specific driving resistances affect each other here, a v-OPT can be determined for constant driving on a straight line for every BEV.

This could be determined by the vehicle's energy management system itself, since the information is already processed in the vehicle. At the same time, all tolerances of the drivetrain (e-machine, power electronics, transmission,...) would be recorded and equipment-specific parameters such as rim size, tyre type, chassis trim position and even tyre pressures would also be included in the v-Opt determination.

The v-Opt determined in this way could be made available to the customer as information, for example, in efficiency mode or in the range monitor.

In a simplified form, v-Opt could also be determined only once for each vehicle derivative on the test bench and this information made available to the customer.

As an example, a test bench measurement is shown below, from which it can be seen that the v-Opt for this vehicle is approx. 70km/h.



Advantage:

This helps the customer to understand his vehicle behaviour by means of a simple and easily understandable v-OPT value and to use this information for optimising consumption in the case of range requirements or also in the case of high environmental awareness. At the same time, this additional information in front of the customer would pick up on the trend of "hypermiling" (achieving maximum range with one "tankful") and actively support it here.

Technical implementation:

The vehicle's energy management system calculates the vehicle-specific energy optimum from the constant journeys at different speeds and passes this value on to the customer as information. This could, for example, be indicated as additional information in a range monitor or displayed as information when efficiency or efficiency+ is activated.