Fig. 9. Vehicle speed (NEDC)

Fig. 12. Electrical Power (NEDC)

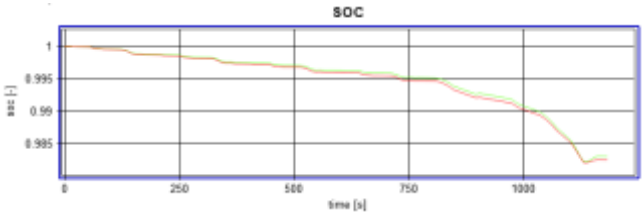

Fig. 13. SOC (NEDC)

Fig. 14. Vehicle speed (WLTP)

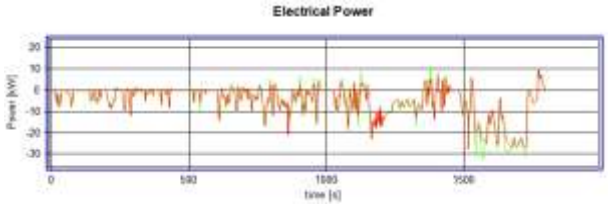

Fig. 15. Electrical Power (WLTP)

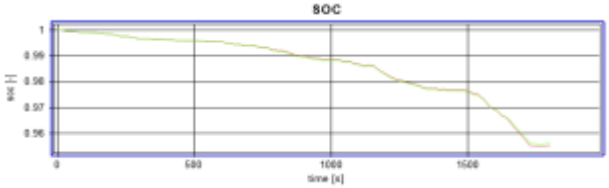

Fig. 16. SOC (WLTP)

In case of the NEDC or the WLTP cycle, the energy savings may seem insignificant. This is due to the length of the NEDC cycle, which is 1180 seconds, or 1800 seconds in case of the WLTP cycle. In the event that the vehicle would endure the cycle for a longer period of time, the energy savings would be more noticeable.

VII. Conclusion

The possibilities for using the two-stage gearbox were only mentioned marginally. The gear ratios for the two-stage gearbox were selected on the basis of a simple optimization. The gear-shifting strategy was selected to use the first gear when driving in the city and the second gear when driving outside the city.

This article has shown the direction for future research on our electric vehicle. One of the topics could involve finding the right combination of motors for use with the two-stage gearbox and improving energy efficiency. Another topic will be to find the correct gear-shifting strategy. This article offers an introduction to this issue. The model created in this research can easily be customized for different applications and for different types of vehicles.

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