Electrification of an CG2300

Background
Dynapac Compaction Equipment develops and produces rollers for soil and asphalt compaction in Karlskrona, Sweden. The move towards zero emissions is ongoing and our first electric machine is to be released in early 2022. Our machines span a wide range from 2 – 17 tons with relatively low volumes and a wide utilization range.

The CG2300 is a medium sized machine of 8.3 tons used for asphalt compaction all over the world. To achieve a high compaction degree, the machine is equipped with vibrating drums.

Aim
This project aims to determine the CO₂ impact when electrifying an CG2300.

Task
- Study the operating cycle of an CG2300. Determine the power and energy need of an electric drive train.
- Choose between LFP and NMC/NCA battery technologies and dimension a battery from energy and power need, for the following two cases.
  1. Assume that only over-night charging is available.
  2. In addition to 1, assume that rapid charging during lunch and coffee breaks is available.
- Select an electrical machine as well as an inverter and establish the losses for the drive cycle.
- Using a Swedish and Polish energy mix, determine the CO₂ impact with the electrified variant versus the original one.

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