

## Public summary

Motocross racing is facing increasing legislative hurdles caused by changes in attitude surrounding their environmental impact. This has caused a number of companies to start developing electric motocross bikes, aiming to get ahead in securing their spot for the market of the future. One of the fields of motocross that has thus far been omitted in this push for electric racing is that of endurance racing (or enduro for short), which is exactly where STERN Motorcycles wants to take their claim. The reason that enduro racing is so difficult for electric vehicles is that their events are often long distance, requiring more battery capacity that current electric motocross bikes are able to deliver on a single charge. Traditional combustion engines that are currently used in these events often also do not last for the entire event, but refueling is many times faster than charging the battery packs of an electric motorcycle.

That is why STERN asked me to design a charging dock that will charge additional battery packs and allows for a quick exchange of drained batteries for freshly charged ones. In order to do this, the assignment was first clearly defined, and then broken up into different topics of research that then led to the basis of a design. This step by step approach of conducting research, formulating requirements and using those to construct concepts is reflective of the ways that design has been taught over the bachelor's course of IDE. The research focuses on the current competitive market, as well as the literal environments that the dock will have to operate in. A more detailed view into the target group and other stakeholders, along with the different functions that are required also helps construct a clear path of the rest of the design process.

This is all done in collaboration with STERN and their continuous feedback, both on the research done and on the final results. These final results consist of a 3D model of the designed charging dock, as well as a list of proposed production process, which together form the basis of eventual real-world production. The final dock is made in such a way that it complements the motorbike that is the main selling point of the company, as well as the battery modules it is made to function in tandem with.

After the completion of these deliverables, the results are discussed with STERN in order to provide a list of recommendations concerning future steps for the design. This then concludes the assignment and will hopefully aid the company in realizing their aspirations in keeping (enduro) motocross possible and sustainable for the future.