THE PROJECT

The goal of this project was to create a battery pack for CanEV's new electric medium-duty truck (e-MDT). Rainhouse has the project management, procurement and assembly experience but needed assistance with testing and modelling. Therefore, UVic's Clean Transportation Research Team of the University of Victoria led by professor Zuomin Dong was contracted.

To get started, we identified several battery suppliers to make an informed selection. For the electric medium-duty truck, we reviewed EcoPower/ETC, a company that provides small quantities and lower cost LFP modules for EV applications, and REPT, a well-established EV supplier with certified and mature EV battery modules provides small quantities at a reasonable cost.

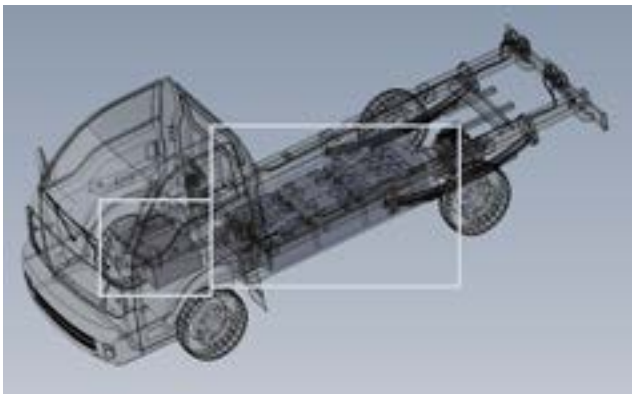
The UVic PRIMED battery facility tested cells from both companies to confirm the 'technical specification' and obtained data from the DP battery performance and thermal behavior models. Although there were no significant differences, CanEv decided EcoPower EP-LPF a77Ah 1P12S power modules were the most suitable. The electric propulsion and battery Energy Storage System (ESS) of the e-MDT were modeled at UVic, and we used the results to support the battery ESS pack design.

We continued our research, but this time to create an extensive list of relevant standards based on similar battery projects and products. These standards showed us ESS pack requirements are based on their application and performance.

After analyzing EV battery selection and the preliminary design, it was time to order the battery modules to later assemble and test the battery pack. Thus, we ordered ten 277Ah 1P12S modules of EP-LPF from EcoPower. These modules were set to arrive in April 2022 and would then allow us to move forward in assembling a prototype pack.

277Ah 1P12S modules of EP-LPF from EcoPower

We carried out a study on various medium-duty trucks (MDTs) to identify the typical design and dimensions of the ladder frame of the truck's chassis. The powertrain system model of CanEV e-MDT was built to access its performance and range using different numbers of LFP battery modules and pack designs. The battery pack consists of 8 EcoPower EP-LFP 277Ah 1P12S battery modules that provide a total of 309V nominal voltage with 81.7kWh and can be mounted and safely protected between the truck's ladder frames. Two additional modules can be mounted under the cab.



Battery pack location rendering.