

Zero-Emissions Innovation

Digital Solutions Optimize Electric School Bus Design with Maya HTT and Siemens PLM



The Lion Electric Co., the leading electric school bus manufacturer in North America, aims to bring sustainable public transportation to the market with zero-emission vehicles. The company, which is headquartered in Saint-Jérôme, Quebec, Canada, believes that transitioning to all-electric vehicles will lead to major improvements in our society, environment and overall quality of life.

Challenge

The Lion Electric Co. sought to optimize their vehicles' performance and maintain their avant-garde status in the market.

One of the engineering challenges associated with developing an electric-powered bus is the thermal management of the battery.

The company recognized that to perform the design space exploration needed to optimize the battery design, they would have to reduce the cycle time between design conceptualization and performance validation. They required a numerical analysis solution that would:

- Facilitate digital modelling and simulation.
- Rapidly correlate physical test results with a high degree of accuracy.

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Success at a Glance

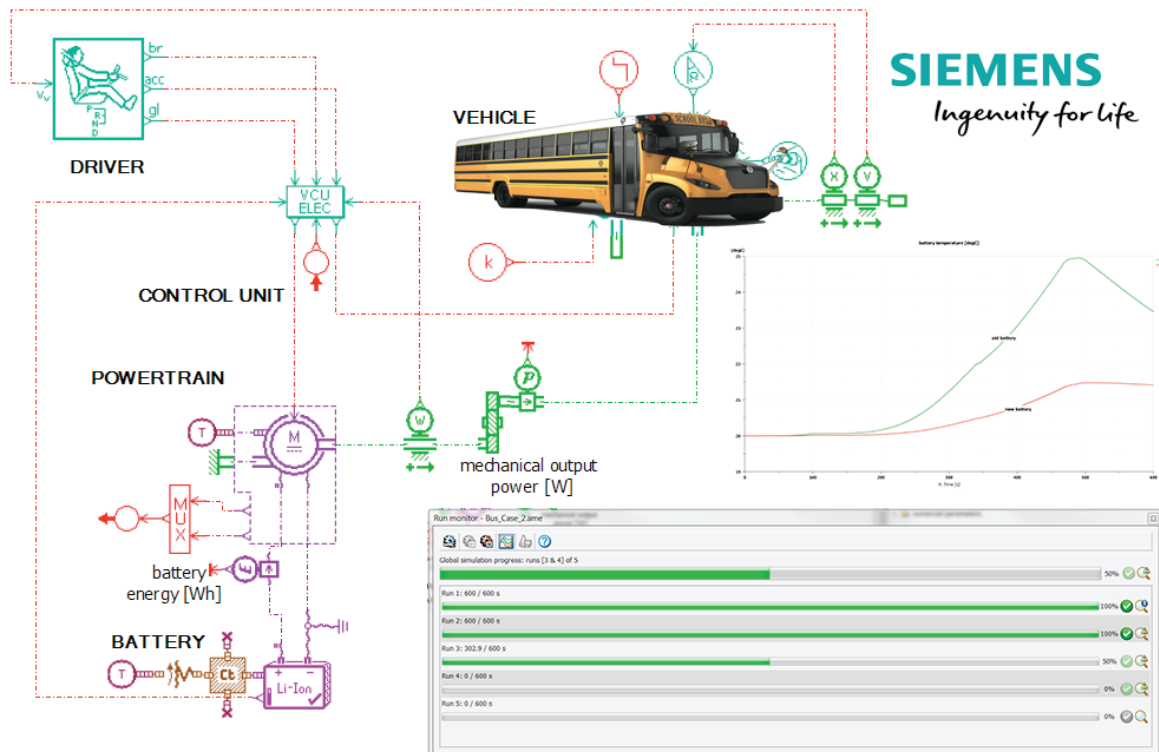
- Optimized the battery design for thermal management
- Validated scenarios early in the design cycle
- Reduced time-to-market

“ The Amesim software solution will allow us to validate different approaches and scenarios very early [in the design cycle], more precisely, various physical phenomena that are coupled together, and that evolve with time, such as mechanical, electrical, hydraulic, thermal, motion, vibration, etc. We need to integrate numerous systems and elements, for example, electric motors, batteries, and heat exchangers, as well as sub-systems for lighting, dashboards, windshield wipers, doors, HVAC, etc. This necessitates testing a variety of scenarios and options to validate for security, consumption, performance, as well as passenger comfort. ”

Bruno Pilon
Engineering Director

Solution

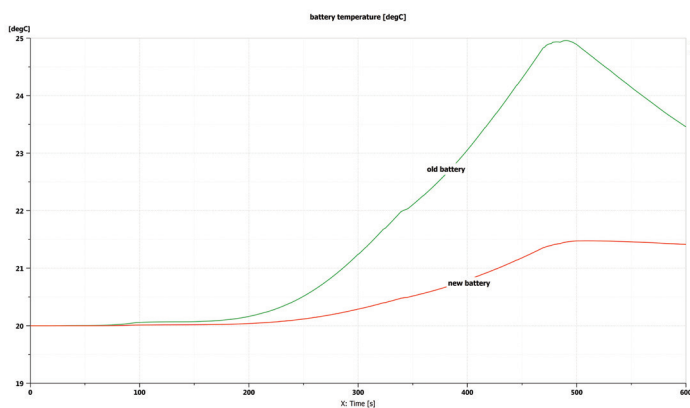
Maya HTT collaborated with Siemens PLM and The Lion Electric Co. to identify Amesim as the right software solution for the numerical analysis. They also conducted a pilot project to better assess the application's functionality. Maya HTT's technical team created a digital model of the battery at the customer site using Amesim, reproducing the thermal exchanges within the battery and iterating on the design until they arrived at an optimized architecture.



Results

Using Simcenter Amesim to reproduce the thermal exchanges within the battery and the forced air cooling enabled The Lion Electric Co. to define the best architecture for all the elements of the battery.

The time and cost savings made it possible devote resources to looking for upcoming technologies that will help The Lion Electric Co. maintain its innovative edge with better products.



“ At The Lion Electric Co., we are at a strategic and technological turning point where we need to ensure not only that we are using the best tools available on the market but also that we are working with the best partners, such as Maya HTT and Siemens PLM. The selection of Amesim for modelling and simulation will allow us to become more performant and predictive - to remain innovative. This investment will allow our R&D department to improve our vehicle performance while reducing physical test phases and reducing costs. ”

Hugues Beaudry

Vice-president Product Development

About Maya HTT

- Industry leading software developer and provider of engineering services in CAE, Product Lifecycle Management (PLM) and Datacenter Infrastructure Management (DCIM)
- Extensive experience in design, analysis, systems integration and deployment
- Specializing in mechatronics, thermal, fluid and structural analysis, and composites
- Technological partner, software editor, and provider of Siemens CAD/CAE/PLM solutions for more than 30 years
- Worldwide customer technical specialist support

