Battery capacity and cost are a decisive factor for the competitiveness of e-buses when compared to traditional diesel buses. In order to reduce cost, battery size is typically minimized. This limited battery capacity is challenged even more during winter months, when buses need to be heated to provide a comfortable environment for the passengers & the driver. With the current technology, up to 60% of the total range of the electric buses that operate in the region of Eindhoven (NL), can be lost during extremely cold days.

The result of such a variability in range is that fleet operators need to introduce buffers & redundancies in the scheduling, thus increasing planning complexity & operation costs. On the road to increase its competitiveness, VDL is developing energy management systems that aim to reduce the energy consumption of its e-buses. This project contributed to this goal by designing a Thermal Management System architecture and modeling useful system dynamics which will aid the development of the energy-saving strategies of the future.