



IN COORDINATION WITH



CASE STUDY



“Chanje’s ground-up designed electric truck was developed as a platform to unlock new e-mobility solutions beyond package delivery, as shown with this prototype integration. Collaborating with Purkeys on using solar panels to supplement the 12v system loads that are ultimately taken from the HV battery helps reduce the range impact. The inverters consistent power delivery allow us to plan the power draw accurately and let the KU team design a smart and scalable system.”

*Alex O.  
Director of Commercial  
Engineering/Test Programs*

## CHALLENGE

*In coordination with the University of Kansas, Chanje supplied the following senior project to a group of KU ME students, hereafter referred to as the “Chanje Design Team.”*

The global electric scooter market is valued at more than \$15 billion and expected to reach nearly \$40 billion by 2024. In the United States, most scooter companies rely on the gig economy to dispatch, collect, and charge scooters. At the current rate of \$5-\$20 per scooter per day, preliminary estimates indicate Chanje vehicles could collect \$10,000-\$20,000 in revenue per month charging and deploying scooters.

The Chanje Design Team was tasked with the design, fabrication, and implementation of a solution within a Chanje vehicle that could:

- Store up to 100 foldable, electric scooters in the back of a Chanje van, making them easily accessible for quick retrieval and deployment
- Simultaneously charge all scooters stored in the vehicle using a combination of off-grid and grid-based technologies.
- Supplement the charging profile using an on-roof solar system.



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## SOLUTION

The Chanje Design Team designed two sizes of modules for carrying and charging the scooters. Each Chanje van holds four modules: two large and two small. Together, the four modules hold 40 scooters.

The charging profile utilizes Purkeys' Solar Bolt™ and Invert™ Pure Sine to provide the power to charge the scooters.

Six Solar Bolt panels were placed on the roof of the vehicle and connected with the controllers to the batteries inside the van. The Invert Pure Sine monitors the battery state of charge and notifies the vehicle operator if the batteries are near depletion.

## CONCLUSION

The Chanje Design Team was able to successfully design a solution to store and charge up to 40 scooters in a Chanje V-Series Panel Van using Purkeys' solar charging and inverter products.

