

USU's Gear Up Team Demonstrates Dynamic Wireless Charging System

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Students from Utah State University's Sustainable Electrifies Transportation (SELECT) research center have successfully demonstrated a dynamic wireless charging system powered by a solar DC microgrid at this year's Greenpower race held at the Utah Motorsports Campus on April 25, 2019. The race was organized by USUStars GearUp.

A team of USU freshmen from the GEAR UP program along with other undergraduates and graduate students from the SELECT Center have developed a charging system that allows the F24 kit cars to recharge wirelessly during the race. The complete system including the solar panels, a Li-ion battery pack and the wireless charging pad are portable and can be setup in less than an hour. Additionally, the system is completely off the grid and can be setup in places where a utility connection is not available.

The demonstrated DC micro-grid consists of three 350 W solar panels feeding into a 3.3 kWh Li-ion battery pack. The wireless charging system transfers energy into the battery pack, delivering a peak power of 800 W when the receiver on the vehicle is aligned with the charging pad on the track. The SELECT team, which conducts its research at USU's Electric Vehicle and Roadway (EVR) research facility and test track, managed to complete the most laps and also the fastest lap in the custom vehicle category. Vehicle data including battery state of charge and speed were displayed in real time on a web app (as shown in Fig. 1) that was accessible by other teams and spectators.

Figure 1. USU student developed app showing the Gear UP vehicle's state of charge and speed in real time.

Over the course of the last two months, the quarter mile track around the EVR has also served as a test track for other participating teams including Edith Bowen Laboratory School and Mt. Logan Middle School.

After the races concluded, the SELECT team from USU fielded questions from a diverse crowd of high school and middle school students and their mentors.

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<https://utahstars.usu.edu/about-us>

<https://www.upr.org/post/driven-succeed-utah-students-build-electric-cars-and-gear-college-0>

<https://utahstars.usu.edu/news-and-highlights/utah-schools-compete-in-electric-car-races>

https://www.hjnews.com/news/education/student-designed-electric-karts-to-race-in-tooele/article_518c3fe5-406d-5cdf-8e21-3deec38cd8bb.html