



PRINCETON RACING ELECTRIC

DONOR PACKET

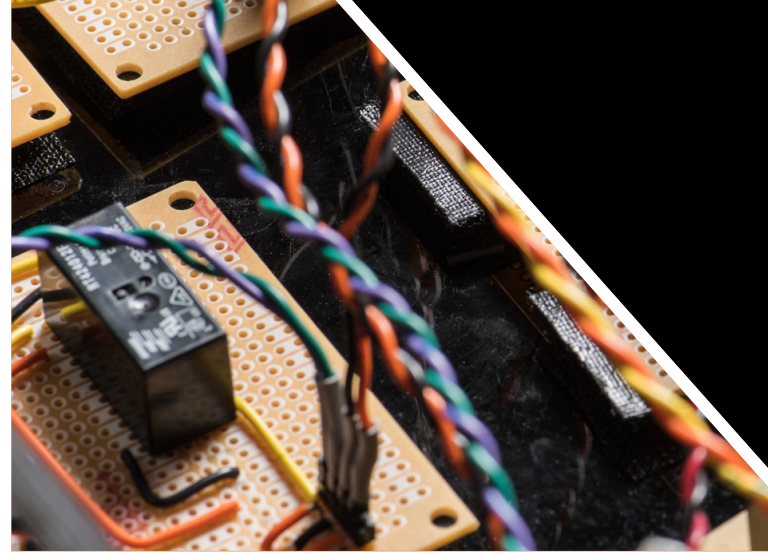
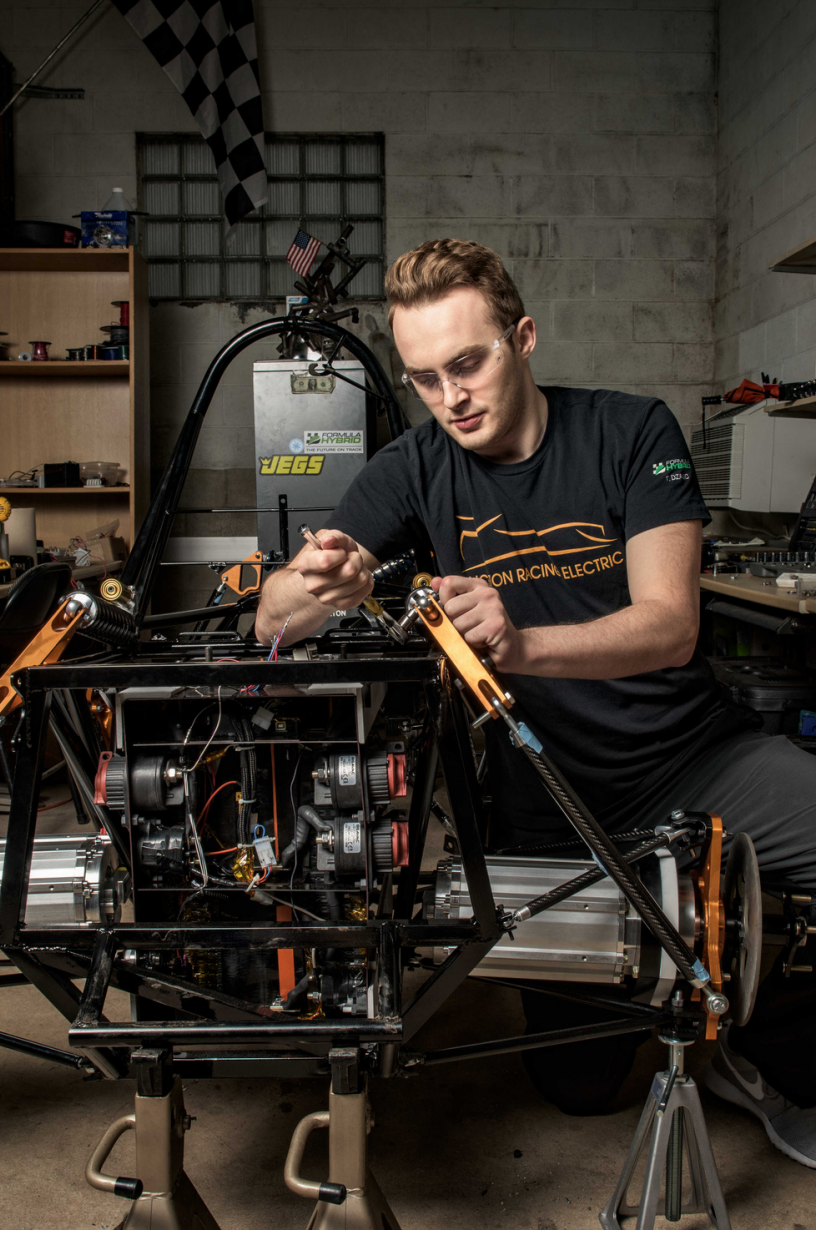
2022-2023



PrincetonRacingElectric.com

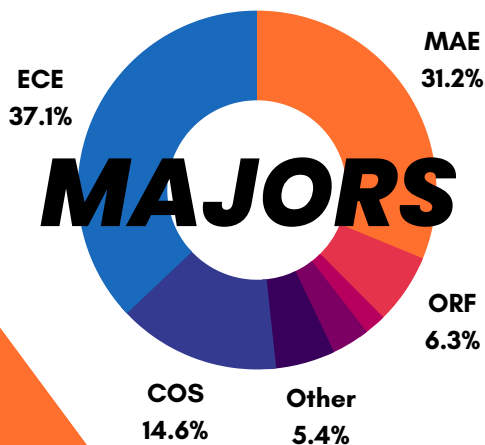
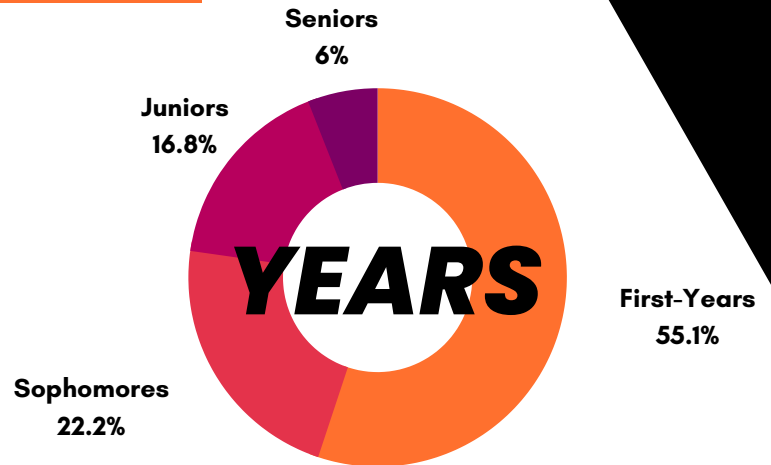
D117 Engineering Quadrangle, 41 Olden Street, Princeton, NJ 08544

pre@princeton.edu



MEET THE TEAM

Princeton Racing Electric is dedicated to **advancing sustainable drive systems** and building **efficient, high-performance** vehicle designs. We are a group of 100+ undergraduate and graduate students across **11 majors** at Princeton University who build a **100% electric vehicle in-house** to race at the annual international Formula Hybrid + Electric (FHE) Competition at the New Hampshire Motor Speedway. Across **20 project teams**, our **hands-on** teamwork teaches all of us to be better project managers, engineers, and leaders.



For the 2023 FHE Competition, we aspire to get back on track by passing an **exhaustive technical and safety inspection** conducted by industry experts, presenting our engineering design goals and project management plan, racing against other universities in a 75-meter **acceleration** test, **autocross** event, and finally a 44-kilometer **endurance** race.

LEADERSHIP BOARD



DANIEL SIMONE
ECE '24
Team Principal



NATHAN GAGE
MAE '24
Chief Engineer



LINDA CHEN
MAE '24
Chief Engineer



ALEX HAYWOOD
MAE '24
Chief Engineer



DAVID SHUSTIN
ECE '24
Chief Engineer



IRIS USHIZIMA
MAE '24
Communications Chair



SULLIVAN MEYER
MAE '24
Pit Crew Chief and DEI Chair



PATRICK KOZAK
MAE '24
Pit Crew Chief



VIVIAN CHEN
ECE '25
Treasurer



RAFAEL COCA
PHY '25
Tech Chair



DIANE YANG
ECE '23
Social and Recruitment Chair

HISTORY

MKO

2012-2016



2012

Team **founded** by 3 engineering students. **First applied engineering student project team** at Princeton.

2015

Team brought our first car to FHE. Although the car did not pass technical inspections, the experience gained provided the framework for PRE's future success.

2016

First car to **pass inspection** and drive under its own power at FHE. **Eighth place** in dynamic events.

2017
New AC motors and a total **weight decrease** of 126 pounds.

2018
New altered chassis and redesigned planetary gearboxes for durability and efficiency.

2019
New drivetrain, increased motor power, and doubled accumulator energy density. Received the **IEEE Excellence in EV Engineering Award** and overall **Second Place**.



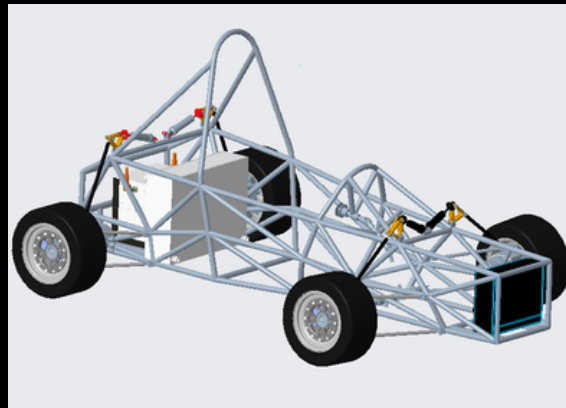
MK1

2017-2019

3x Second Place Overall
2x IEEE Excellence in EV Engineering

MK2

2021-2023



2021

Team resumed in-person meetings and manufacturing after the COVID-19 pandemic. Operations moved into a **new dedicated garage** at the Engineering Quadrangle on-campus. Attended to FHE to learn as a group.

2022

Dedicating fall semester to manufacturing and spring semester to **testing vehicle** and **mock inspections** in advance of FHE.

2023
The team will begin designing an HV vehicle to include:

Regenerative braking, allowing for greater endurance and less wear on our braking system.

Smaller, lighter, more aerodynamic and ergonomic **chassis** for greater speed performance and driver comfort.

Optimized **suspension** to eliminate loss from non-ideal road conditions.



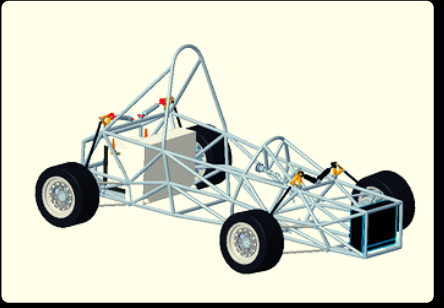
MK3

2023+

DEVELOPMENT ROADMAP

1

1. DESIGN



2

2. DESIGN REVIEW



4. TEST



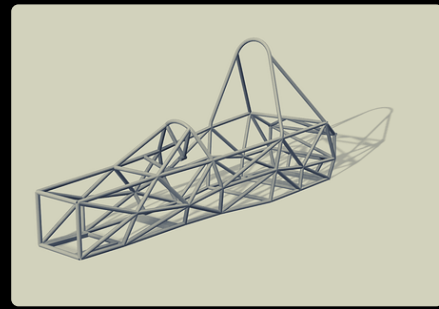
3

3. PROTOTYPE



4

6. REDESIGN



5

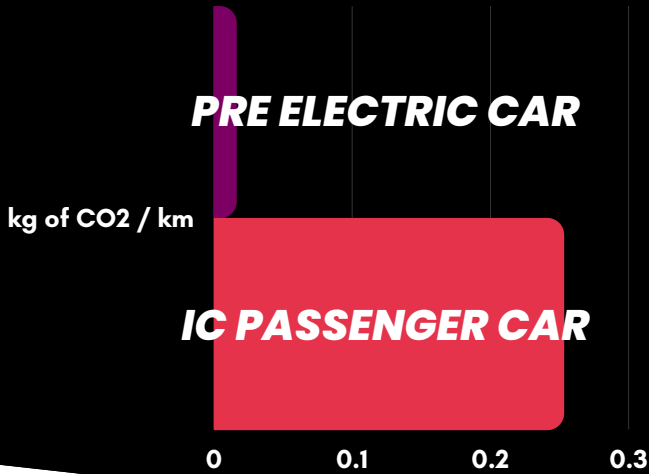
5. COMPETE



6

OUR VALUES

CARBON EMISSIONS PER
DRIVEN KILOMETER



At PRE, our goal is to develop **sustainable powertrains and vehicles**. Each year, we reflect upon the alignment of our design with these values.

Based on the 2020 US Energy Information Administration's electricity profile and our vehicle details, we estimate our CO2 generation at **0.0165 kg of CO2/km**.

Compared to a **typical EPA estimate** of a **passenger car** at **0.253 kg of CO2/km**, our vehicle produces **93.5% less carbon emissions** for the same distance travelled.

We also minimize the number of petroleum-based products used. In our design, motor oil is the only petroleum-based product. To further **minimize the carbon footprint**, we use **carbon-neutral Pennzoil Platinum Full Synthetic Motor Oil**.

FROM OUR TEAM PRINCIPAL

Dear friend,

Princeton Racing Electric is a group of **extremely motivated, talented, and interdisciplinary students** focused on building a fast electric race car, **satisfying our curiosity**, and **creating a community of like-minded enthusiasts**.

This year, we hope to debut our new and improved vehicle, featuring some of our most ambitious design ideas up to this point: a **4WD water-cooled powertrain**, a completely student-designed and welded chassis, an overhauled low-voltage system, and an innovative **traction control implementation**. At the same time, we have also revised our administrative structure, fielding a crew of **11 officers** and **18 project leaders**. Our new team architecture has allowed us to put into effect a "tick-tock" R&D cycle, where we design and manufacture our current vehicle, the MK2, as well as research and draft our next-generation vehicle, the MK3.

Our endeavors **would not have been possible without our donors**, and we are **deeply grateful** to everyone, including Princeton, PRE alumni, and corporate donors for their **continued support**. Your support enables not only building our vehicle, but also the intellectual development, skills, and growth of our members, as engineers, project managers, and entrepreneurs.

On behalf of everyone on PRE, I hope that you will **consider joining our team** as a donor and potential future employer, but more importantly, as a **partner and friend**. We are excited to work with you!

Charging forward,

Daniel Simone



HOW TO SUPPORT US

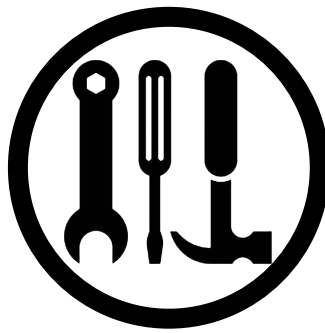
Princeton Racing Electric relies heavily on donations from both **individuals** and **businesses** to sustain our work.

How can you support us?

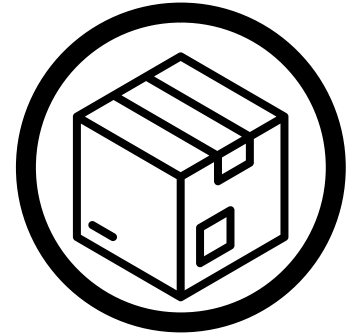
WAYS TO DONATE



Our team uses **monetary donations** to purchase materials and components, maintain and replace garage equipment, and cover competition and travel expenses.



Better **tools** help us work more efficiently and safely during fabrication and **manufacturing**.*



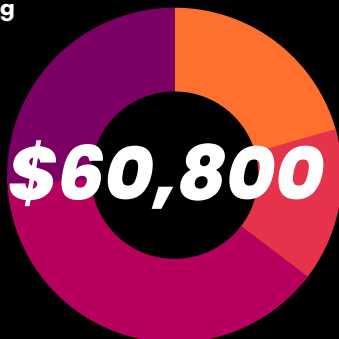
We always appreciate **material, software, and product donations** or discounts.*

* For tools and materials donation, please contact pre@princeton.edu for more information.

2022-2023 BUDGET

MK3 Chassis, Suspension, Steering
\$15,700

Competition & Team Costs
\$12,500



MK3 Powertrain & Regenerative Braking
\$23,600

MK2 Costs
\$9,000

By supporting PRE, donors **support future business and engineering leaders** by providing valuable practical experience.

Help us **prepare students** for future careers.

Help us **inspire passion** for motorsport and innovation.

We are a **501(c)(3) non-profit organization**, so all monetary donations made towards Princeton Racing Electric are **fully tax-deductible**.

If you want to make motorsports part of your business plan, please visit our website PrincetonRacingElectric.com/donate and contact us at pre@princeton.edu.

HOW TO SUPPORT US

continued

DONOR TIERS

Benefits	SUPPORTER (\$500)	BRONZE (\$1,000)	SILVER (\$2,000)	GOLD (\$5,000)	PLATINUM (\$10,000)	TITLE (\$15,000)	
Name & Logo on Website	✓	✓	✓	✓	✓	✓	
Newsletter with Team Info & Updates	✓	✓	✓	✓	✓	✓	
Company Name and Logo on Car		✓	✓	✓	✓	✓	
Recognition on Team Apparel			✓	✓	✓	✓	
Access to Resume Book			✓	✓	✓	✓	
Priority on Logo Placement					Medium	High	Highest
Logo Size on Site					Medium	Large	Largest
Access to Team Members for Off-Campus Visits						✓	✓
On-Campus Vehicle & Facility Tour							✓
Custom Benefits							✓