



MARKETING  
BROCHURE  
2022

# TEAM OJAS

Vellore Institute of Technology

Vellore Campus





# CHANCELLOR'S MESSAGE

**Dr. G Viswanathan**

Founder and Chancellor

Former Member of Parliament

Former Minister, Govt. of Tamil Nadu

President, Education Promotion Society of India, New Delhi



Dear Sir,

It is with pride that I inform you, that Team OJAS is the only official Formula Electric Team of VIT University.

Team OJAS has shown undeterred will since the time of its inception when it was amongst the only 2 Formula Electric teams in India.

Having qualified and being one of the only 3 electric teams from Asia in Formula Student Germany 2015 was another feather in their hat amongst the other accolades they've brought to the country and the University.

This year the team has set for itself bigger goals which require extensive technical and financial support from the government and industries. Your support shall not only go a long way in aiding their endeavours but also add to the international recognition of your brand.

Moreover, your association with Team OJAS will bring forth a new pool of industry ready engineers to the engineering sector.

Therefore, I humbly seek your generous support for Team OJAS to help them achieve what they set out to

Thanking You,









# **FORMULA STUDENT**

**Formula Student** is an international engineering competition conducted by the Society of Automotive Engineers with the goal to develop and provide a platform for student engineers to experience, build, and learn. It offers a unique way to test students' theoretical knowledge in a practical context. Students gain and develop skills such as engineering, project management and teamwork.

## **The Event**

Points are earned in a series of off track, "Static" events, and on track, "Dynamic" events. The team with the most points at the end of the competition wins. The growing popularity of the competition is proven by the rapidly rising number of participants and the establishment of new events.

### **Static events:**

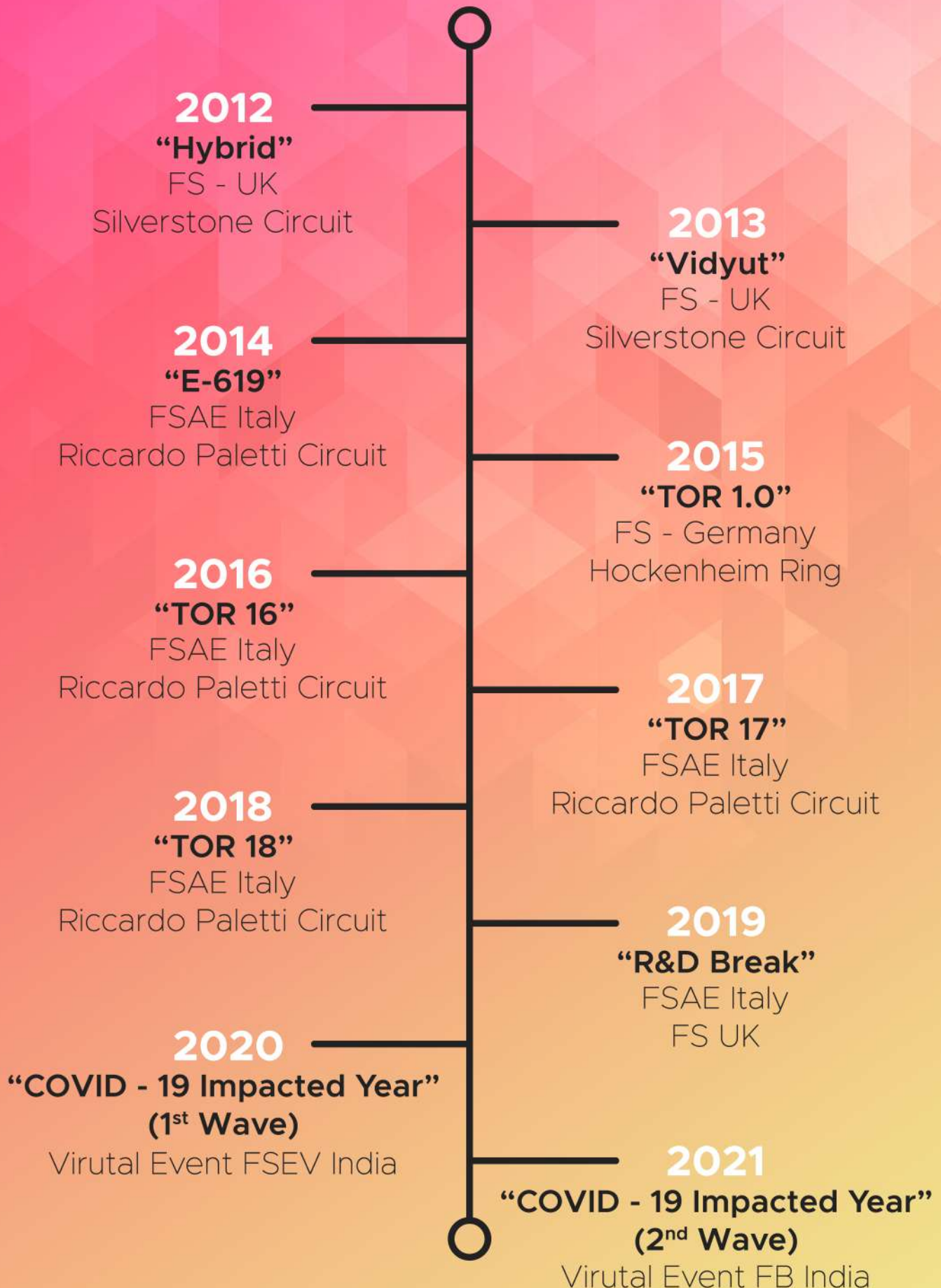
1. Business presentation 75
2. Engineering design 150
3. Cost Analysis 100

### **Dynamic Events:**

1. Acceleration 75
2. Skid-pad 50
3. Autocross 150
4. Endurance 300



# HISTORY OF PROGRESS





# OUR MISSION



## **INNOVATE**

Reinvent EV Technology



## **GROW**

Bring about vigor and enthusiasm in engineering



## **IMPACT**

Venture into new domains  
and perfect the definition  
of EV

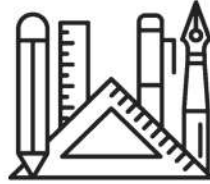


## **ACHIEVE**

Improve upon designs  
and top the charts every  
year

# OUR TIMELINE

**DESIGN**



**PROCUREMENT**



**MANUFACTURING**



**ASSEMBLY**



**TESTING**





# ABOUT OUR TEAM



Team Ojas's ultimate objective is to stand on the podium amongst the best Formula Student Electric teams in India. We as a team believe it's high time since a change was brought into the sport and now the need stands stronger than ever with age-old combustion vehicles causing uncontrollable pollution and degrading the environment. Driving the wheel of revolution, Team Ojas's motto is the 3S's - Speed, Safety, and Sustainability.



# OUR DEPARTMENTS

Powertrain  
Department

Vehicle Dynamics  
& Brakes Department

Chassis  
Department

Composites and  
Aerodynamics  
Department

Autonomous  
Department

Transmission  
Department

Design and  
Management  
Department

Communications  
and Control  
Department

Battery Pack  
Department





# MEET OUR TEAM



**ATHARVA VIKAS SHEDGE**

**AERODYNAMICS  
&  
COMPOSITES HEAD  
TECHNICAL DEPARTMENT**



**SEHAJ SINGH**

**MANAGEMENT HEAD  
MANAGEMENT DEPARTMENT**



**YASH PATHAK**

**CHIEF TECHNICAL OFFICER  
TECHNICAL DEPARTMENT**



**DIVYANSH AGARWAL**

**AUTONOMOUS HEAD  
AUTONOMOUS DEPARTMENT**



**SUSHOVAN SAMANTARAY**

**TEAM CAPTAIN  
TECHNICAL DEPARTMENT**



**SANJIT FRANKLIN**

**ELECTRICAL HEAD/ESO  
ELECTRICAL DEPARTMENT**



**N S AKARSH**

**VEHICLE DYNAMICS  
&  
BRAKES HEAD  
TECHNICAL DEPARTMENT**



**ESIKELA MEGHANATH**

**CHASSIS HEAD  
TECHNICAL DEPARTMENT**



**ASWANTRAA U S**

**TRANSMISSION HEAD  
TECHNICAL DEPARTMENT**



**HARRIS JOHN**

**HIGH VOLTAGE HEAD  
ELECTRICAL DEPARTMENT**



# OUR HALL OF FAME

## FORMULA GREEN COIMBATORE

2<sup>nd</sup> Overall  
1<sup>st</sup> Buisness Presentation  
Best Design  
2<sup>nd</sup> Acceleration  
2<sup>nd</sup> Autocross  
2<sup>nd</sup> Skid Pad

**2017**

## FORMULA BHARAT COIMBATORE

2<sup>nd</sup> Overall  
1<sup>st</sup> Cost Report  
3<sup>rd</sup> Business Presentation  
6<sup>th</sup> Engineering Design  
Report

**2018**

## FORMULA GREEN COIMBATORE

1<sup>st</sup> Overall  
2<sup>nd</sup> Buisness Presentation  
Best Design  
1<sup>st</sup> Acceleration

**2018**

## FORMULA ELECTRIC ITALY

5<sup>th</sup> Overall  
4<sup>th</sup> Cost Report  
5<sup>th</sup> Business Presentation  
4<sup>th</sup> Engineering Design  
Report

**2019**



# OUR HALL OF FAME

**FSEV**

7<sup>th</sup> Overall  
Best Battery Design  
Best Powertrain Design

**2019**

**FSEV**

19<sup>th</sup> Overall  
15<sup>th</sup> FMEA  
25<sup>th</sup> Procurement  
20<sup>th</sup> Management  
13<sup>th</sup> Battery Design  
14<sup>th</sup> Powertrain Package  
Design  
11<sup>th</sup> EV Presentation

**2020**

**FORMULA BHARAT**

8<sup>th</sup> Overall  
7<sup>th</sup> Engineering Design  
12<sup>th</sup> Buisness Plan

**2021**



## **STEERING AND SUSPENSION**

- Rack and Pinion steering system.
- Double A-Arm suspension push rod actuated.
- Race spec dampers: Ohlin's TTX – 25.
- Carbon Fiber A-Arms and pushrods.
- CNC machined Aluminium is used for custom designed wheel hubs & uprights.
- Suspension Modelling & Structural Analysis using Lotus Shark & Ansys.

## **WHEELS**

- 13-inch Continental Tires - 205/470 R13 34M (Dry and Wet)
- Tire Modelling using Adams Car
- Carbon fiber wheel rims – reduces the weight by 2 kgs on each wheel assembly.

## **Brakes**

- Stainless steel, semi floating disc brakes on all 4 wheels.
- Hydraulic actuated with steel brake lines
- Dual master cylinder setup: Tilton-78 series
- Brake calipers: Wilwood PS-1
- Thermal & Structural Analysis via Ansys



## **AERODYNAMICS**

- Reducing the weight of the aerodynamic package to make it more efficient.
- Drag reduction
- Improving Downforce
- Reduction in turbulent flow across side pods to improve cooling.

## **TRANSMISSION**

- Transmission system
- Powertrain
- To increase the efficiency of a motor.
- To limit the energy consumption under 6KWh.
- To complete acceleration event in under 5s.

## **DRIVETRAIN**

- To decrease the size of transmission system.
- To reduce weight of drivetrain components.

## **CHASIS**

- One piece tubular space frame
- Tubes made of chromoly steel
- Wheel base of 1550 mm



## **AUTONOMOUS**

- 3D depth estimation perception from single stereo camera for the use case with  $>0.85$  precision.
- Produced advanced control systems using Model Predictive Control.
- Integrate and implement all sub-systems in harmony.
- Use ML/AI to improve and optimize all subsystems based on data from all other departments.

## **BATTERY PACK**

- Designed to accommodate 190 cells of high energy density and power.
- Features a carbon fibre container that is stronger and yet lighter than aluminium and steel.
- Cooled by an active air cooling system that can keep the battery temperature in its safe limits even at its extreme discharge conditions.

## **POWERTRAIN**

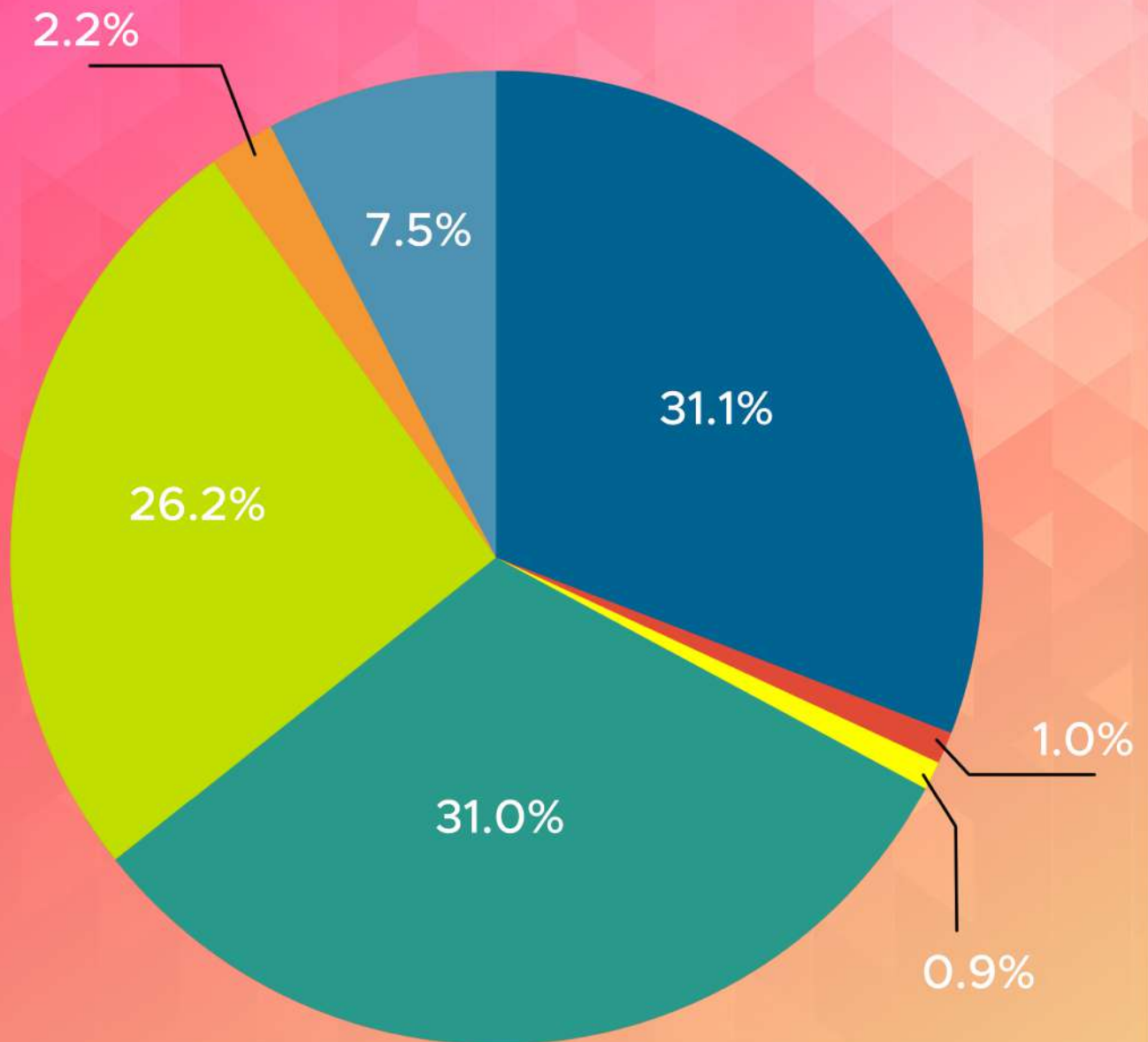
- Minimizing overall energy expenditure of the vehicle.
- Operating EMRAX 228 motor in higher efficiency region by selecting appropriate gear ratio.
- Implementation of parallel regenerative braking in the near future.

## **LOW VOLTAGE**

- Increased accuracy in Battery Management System Algorithm
- In-house Data Acquisition System



# BREAKDOWN OF 2022 BUDGET

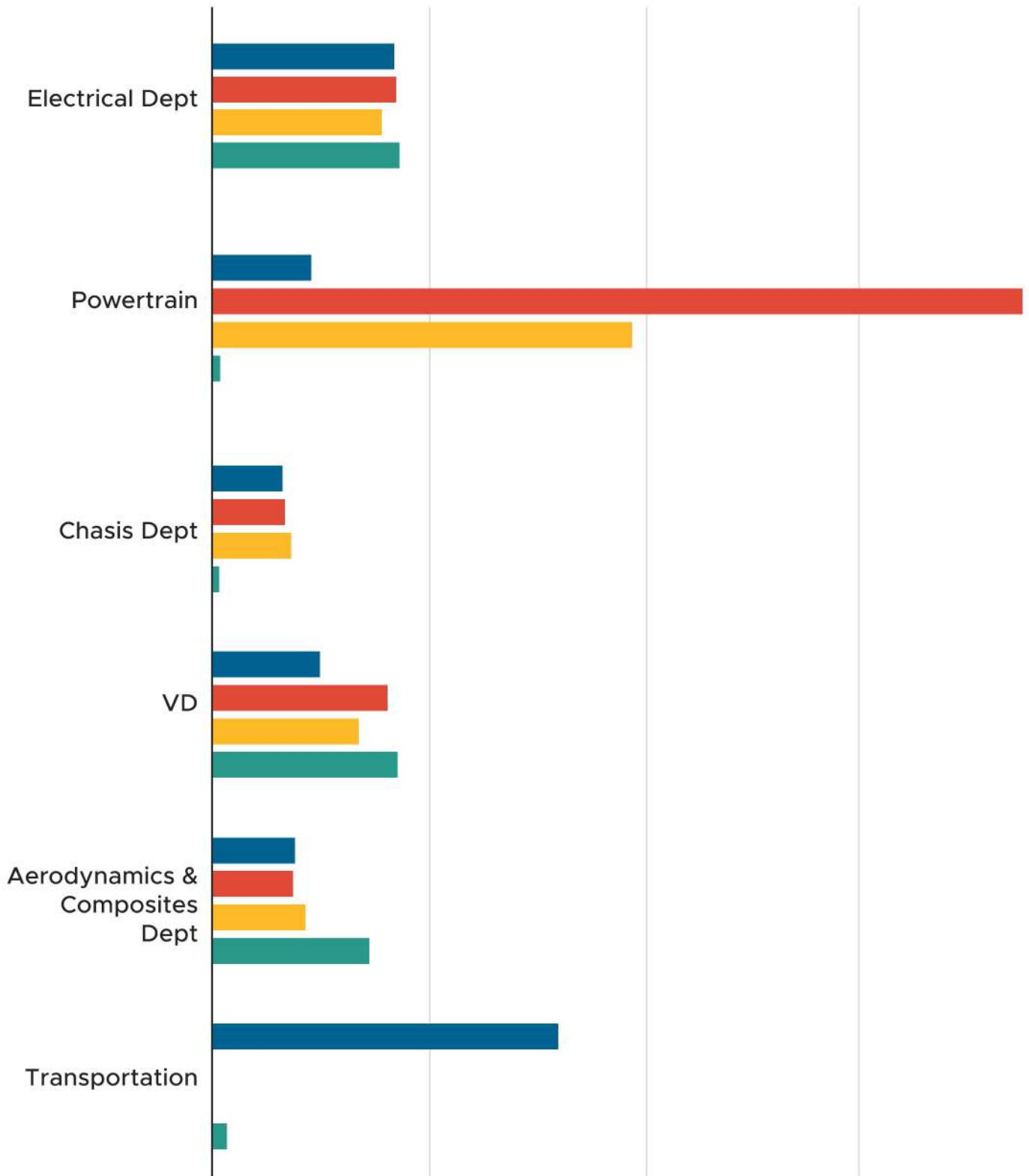


- Electrical Dept
- Total Buffer
- Transportation
- Aerodynamics
- Vehicle Dynamics
- Chasis Dept
- Powertrain

# Year on Year Budget Distribution

■ 2018 ■ 2019 ■ 2020 ■ 2022 ( FORECASTED)

FINIANCES RELATED TO TOR





# SPONSORSHIP HIERARCHY



Platinum



Gold



Silver



Bronze

**We are looking for sponsors to support our initiative of #ElectrifyingTheFuture. If you like what we do, you can support our cause in the following ways:**

1. Provide monetary support
2. Offer technical expertise
3. Sponsor manufacturing
4. Sponsor procurement
5. Provide technical tools and softwares

# CONTACT US



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