



KIIRA ELECTRIC VEHICLE CONCEPT



A Step Into The Green Future

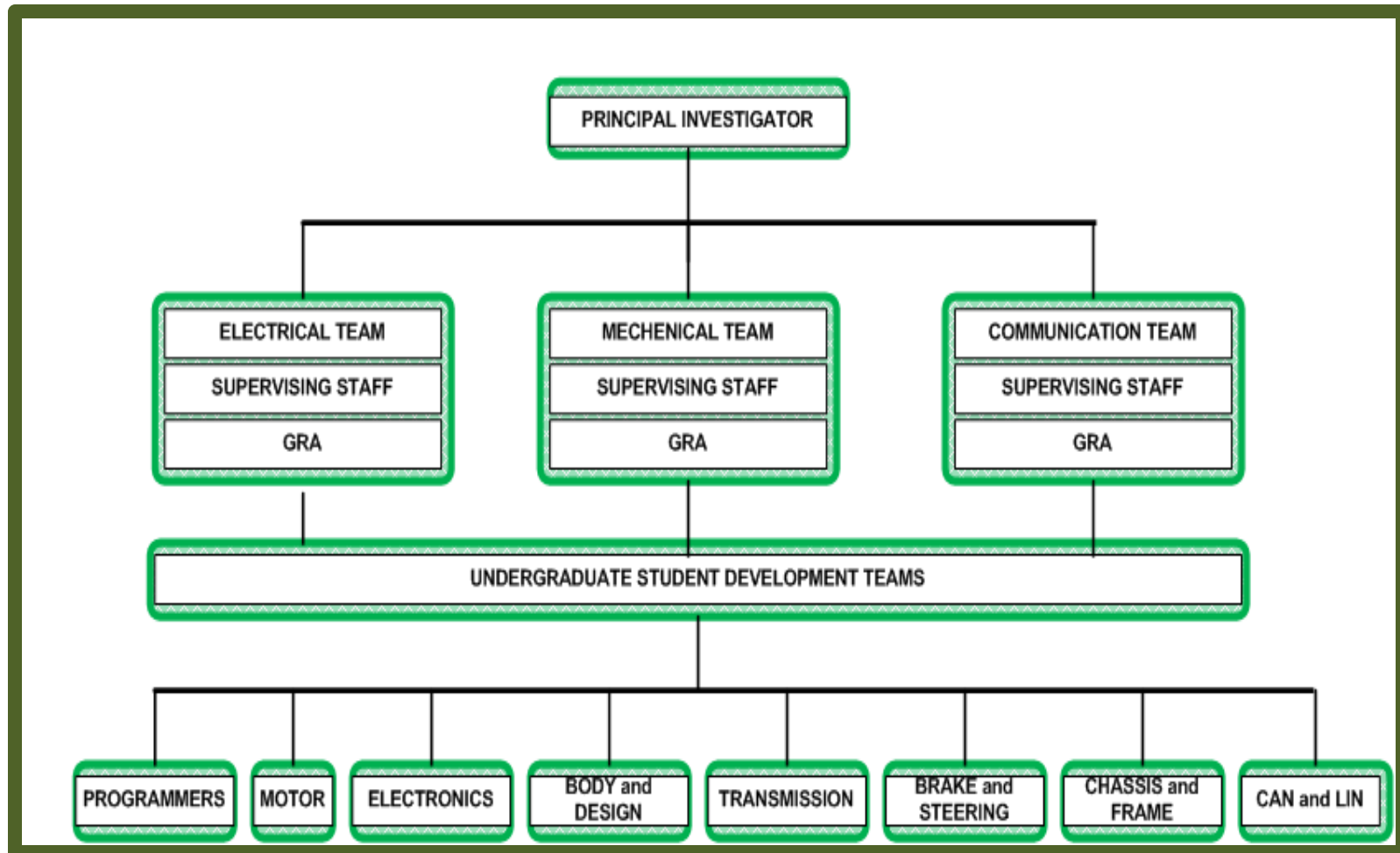
Presentation Outline

- **About the project**
- **Project Organisation**
- **2 Seater Systems and Sub-systems Summary**
- **Electrical System**
- **Communication System**
- **Mechanical Systems-Body**
- **Frame**
- **Suspension and Steering**
- **The Chassis and Motor Drive**
- **Vehicle Flag**

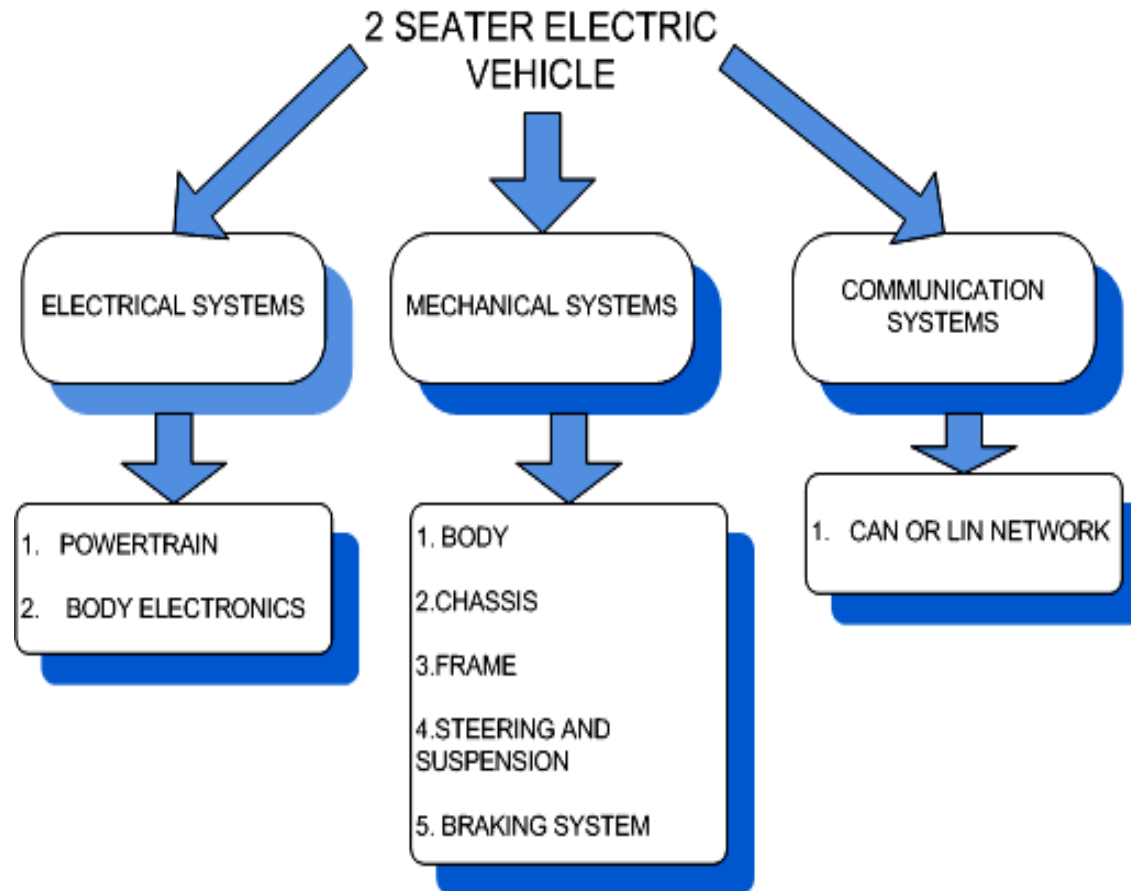
About The Vehicle Design Project

- **VDP is an innovative research project based at the Faculty Of Technology with a mission of developing cost effective and environmentally friendly automobiles for Africa**
- **Our main objective is to build a 2 seater Electric Vehicle as proof of concept**
- **Currently organised into 3 major Teams , the Electrical Team, Mechanical team and The Vehicle Network team**

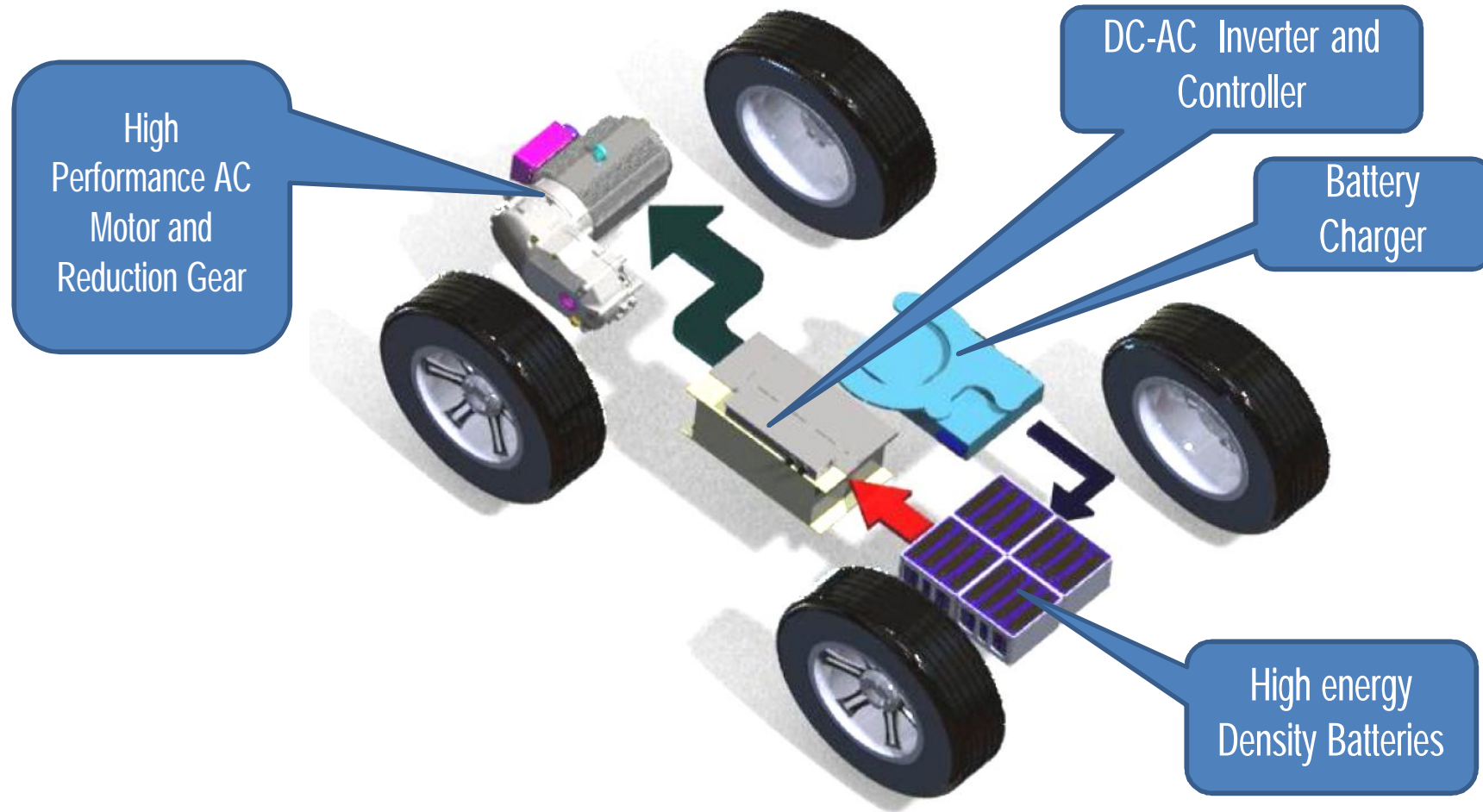
Project Organogram



KIIRA Systems and Sub-Systems



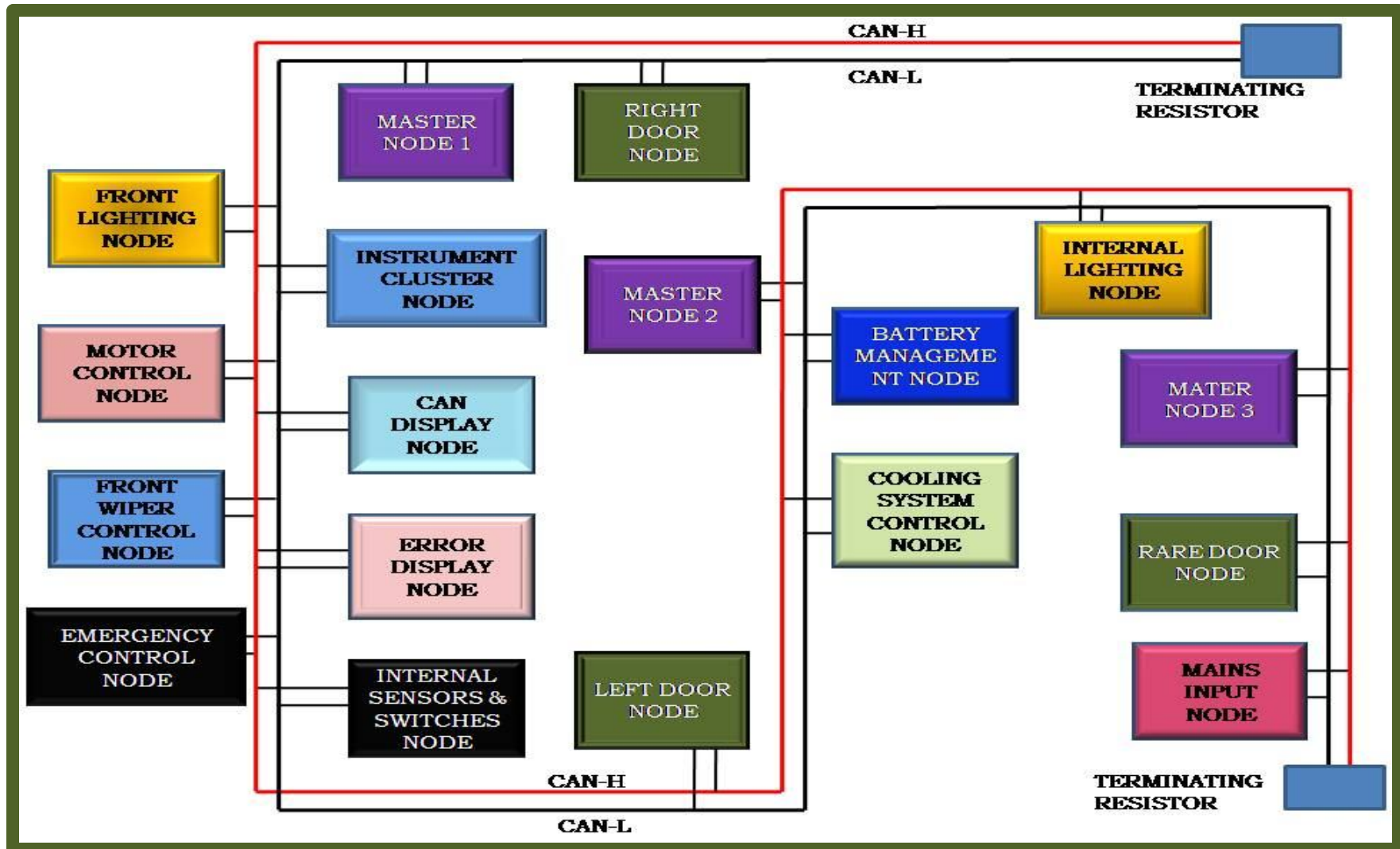
Electrical System-Powertrain



System Summary

Component	Type	Status
Motor and Motor Controller	3 Phase AC Induction Motor	Covered under Procurement
Battery Pack	Lithium-ion Batteries-LEV50-4	Covered under Procurement
BMS	Daisy Chain (Ring Topology)	Covered under Procurement
Battery Charger	Single Phase Intelligent charger	Covered under Procurement

Communication Network and Electronics



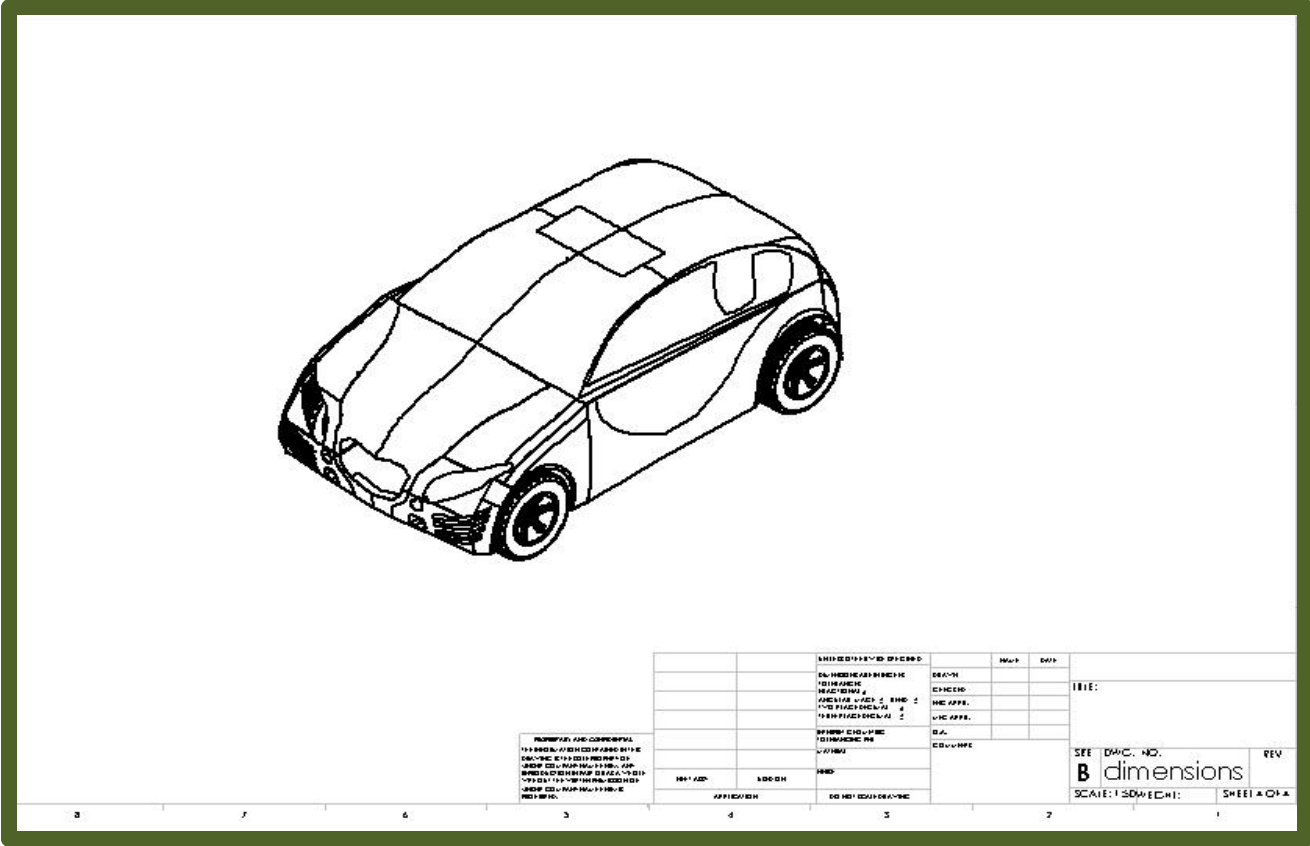
Communication Network Description

Node	Purpose
Master	Controls communication between all system Node
CAN Display	Display of communication Parameters for Driver Communication Network interaction
Motor Control	Node for communication of Driver motion control parameters to the motor
Front Lighting	Communication of control and Error messages between the Front Lights and Other Nodes
Front Wiper Control	Communication of control and Error messages between the Wipers and Other Nodes
Instrument Cluster	Communication of Control and Error messages between the speedometer, Tachometer , Battery Meter and Other Nodes
Internal Sensors and Switches	Communication of Control and Error Messages Between internal switches and Other Nodes
Right and Left doors	Communication of Control and Error Messages Between Doors and Other Nodes
Battery management	Communication of Control and Error Messages Between the Battery system and Other Nodes
Cooling System	Communication of Control and Error Messages Between the Powertrain system and Other Nodes

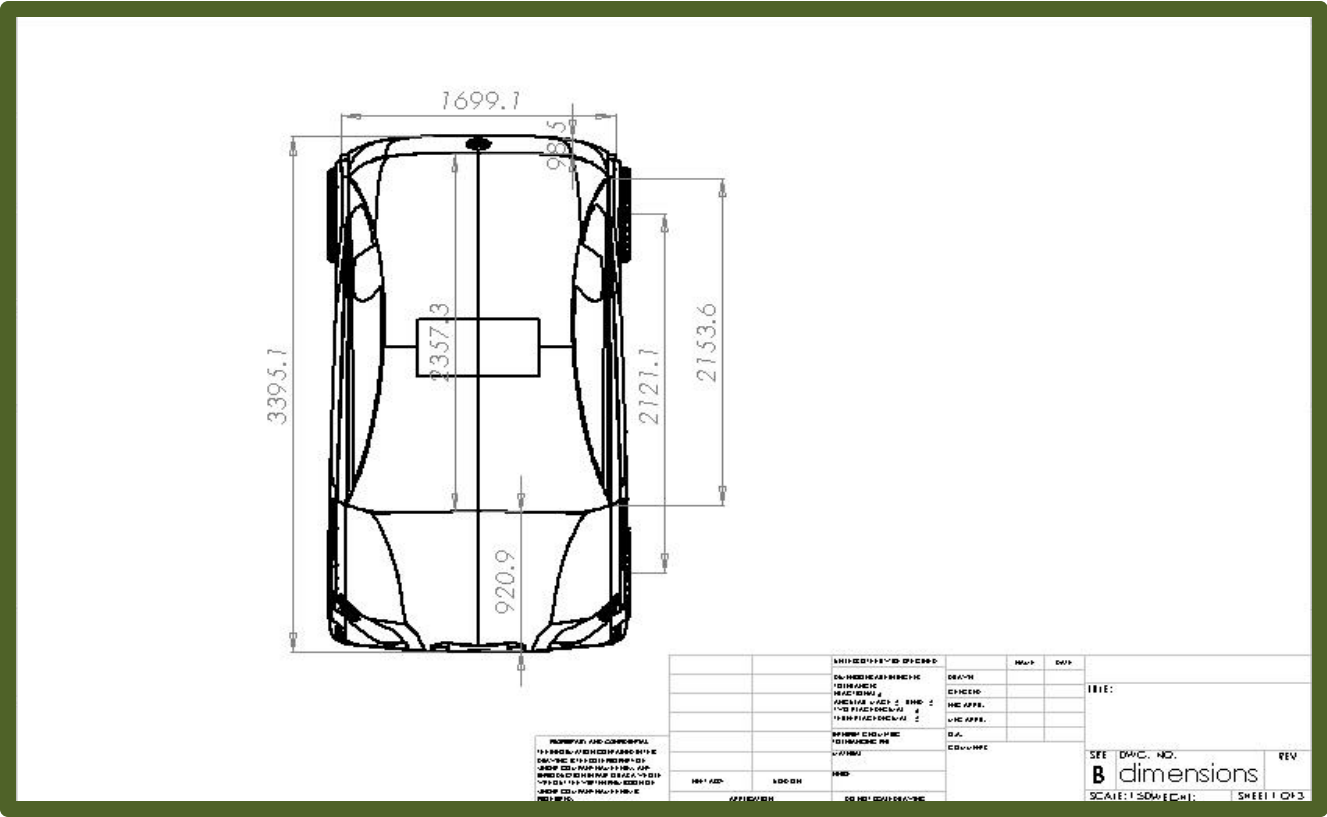
Communication System and Electronics Status

Component	Type	Status
Communication Master Node	Freescale MPC555 CAN Controller	Covered under Procurement
CAN display	Kongsberg CAN display	Covered under Procurement
Lighting	12 V LED Lighting System	Covered under Procurement
Wiper electronics Node		Covered under Procurement
Internal Sensors and switches		Covered under Procurement
Door electronics		Covered under Procurement
Battery Management Node		Covered under Procurement
Error display electronics Node		Covered under Procurement
Cooling System Electronics		Covered under Procurement
Motor Management Node		Covered under Procurement

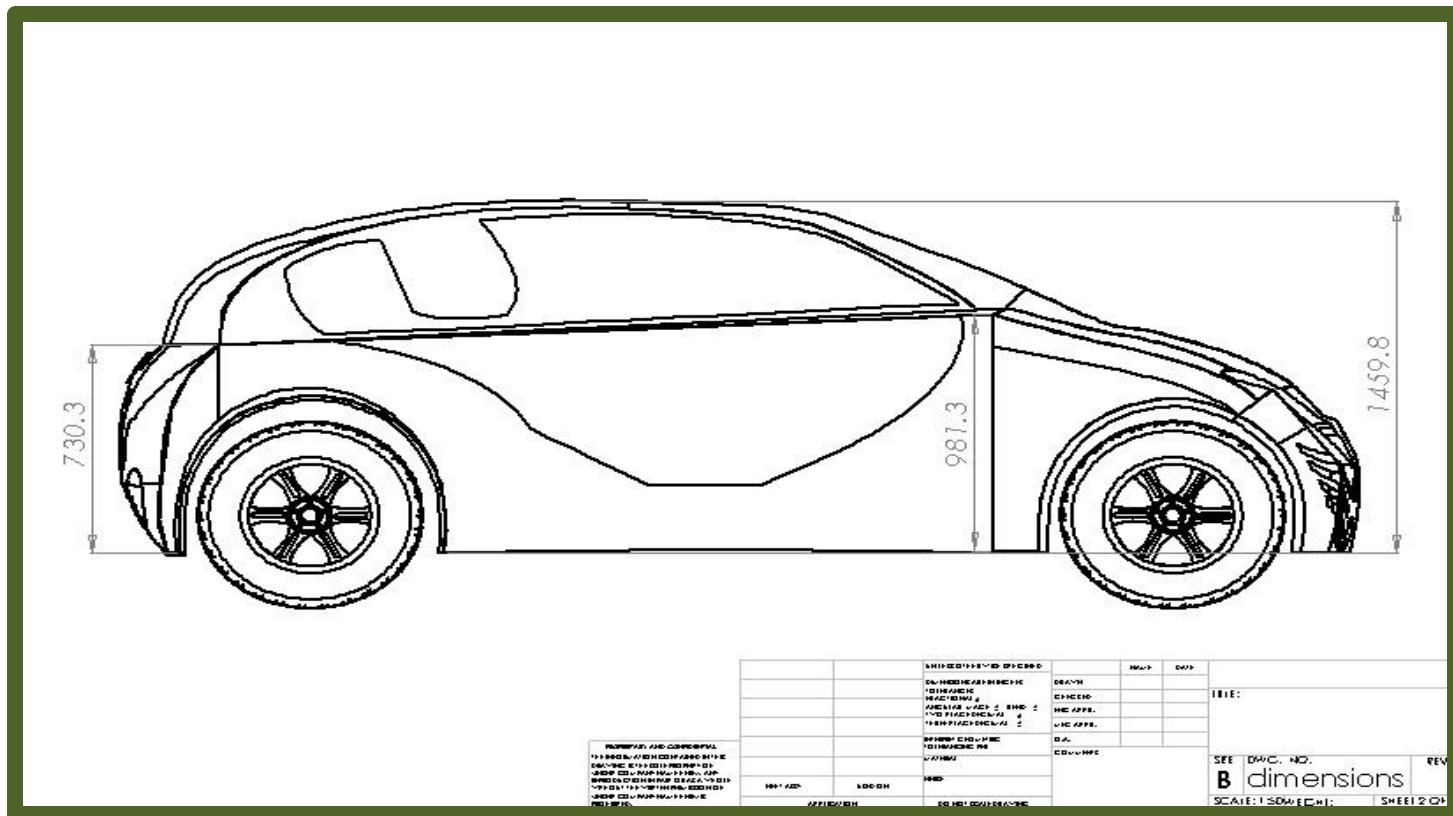
2 D body Design-Isometric View



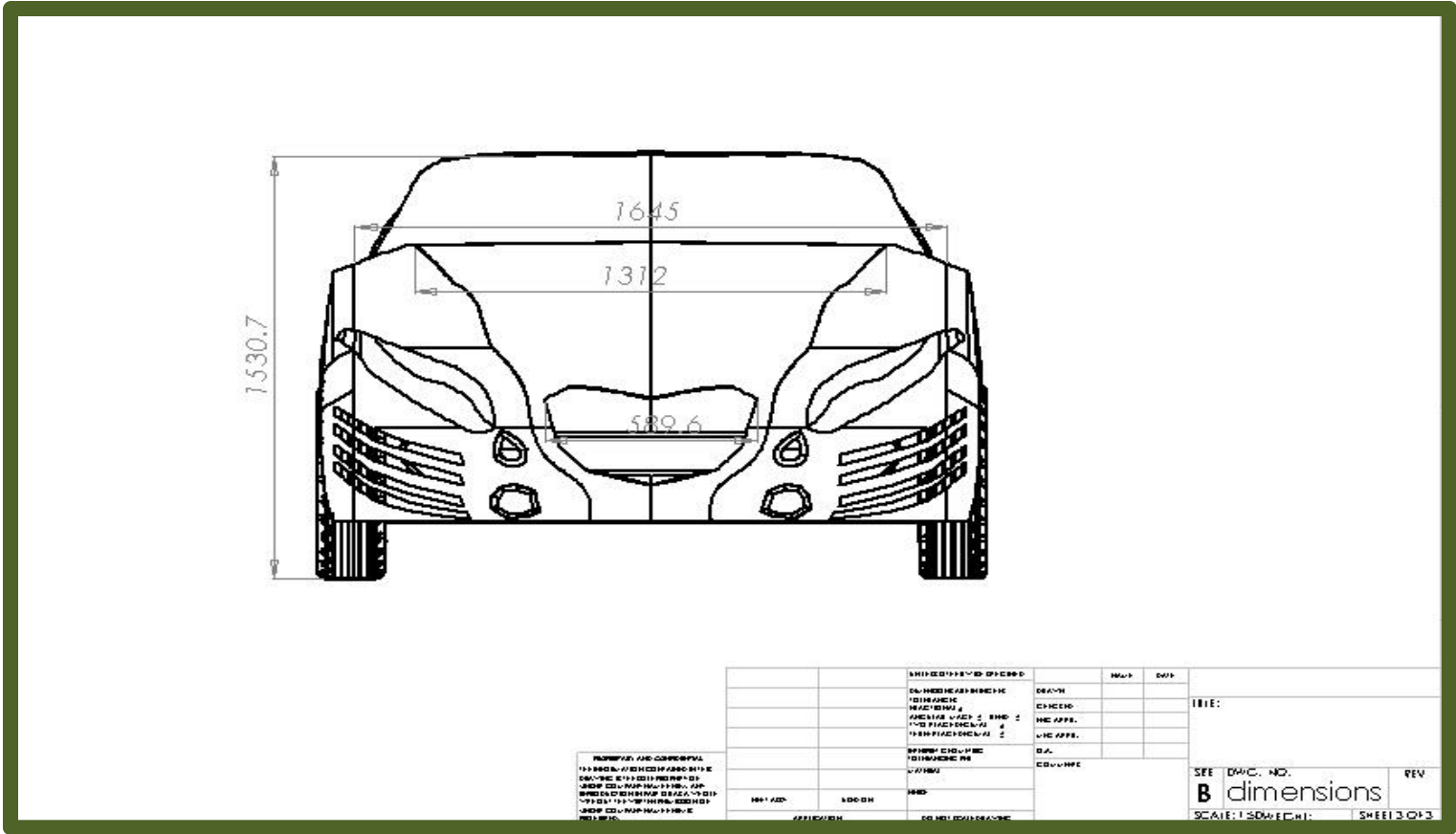
2 D body Design-Top View



2 D body Design-Side View

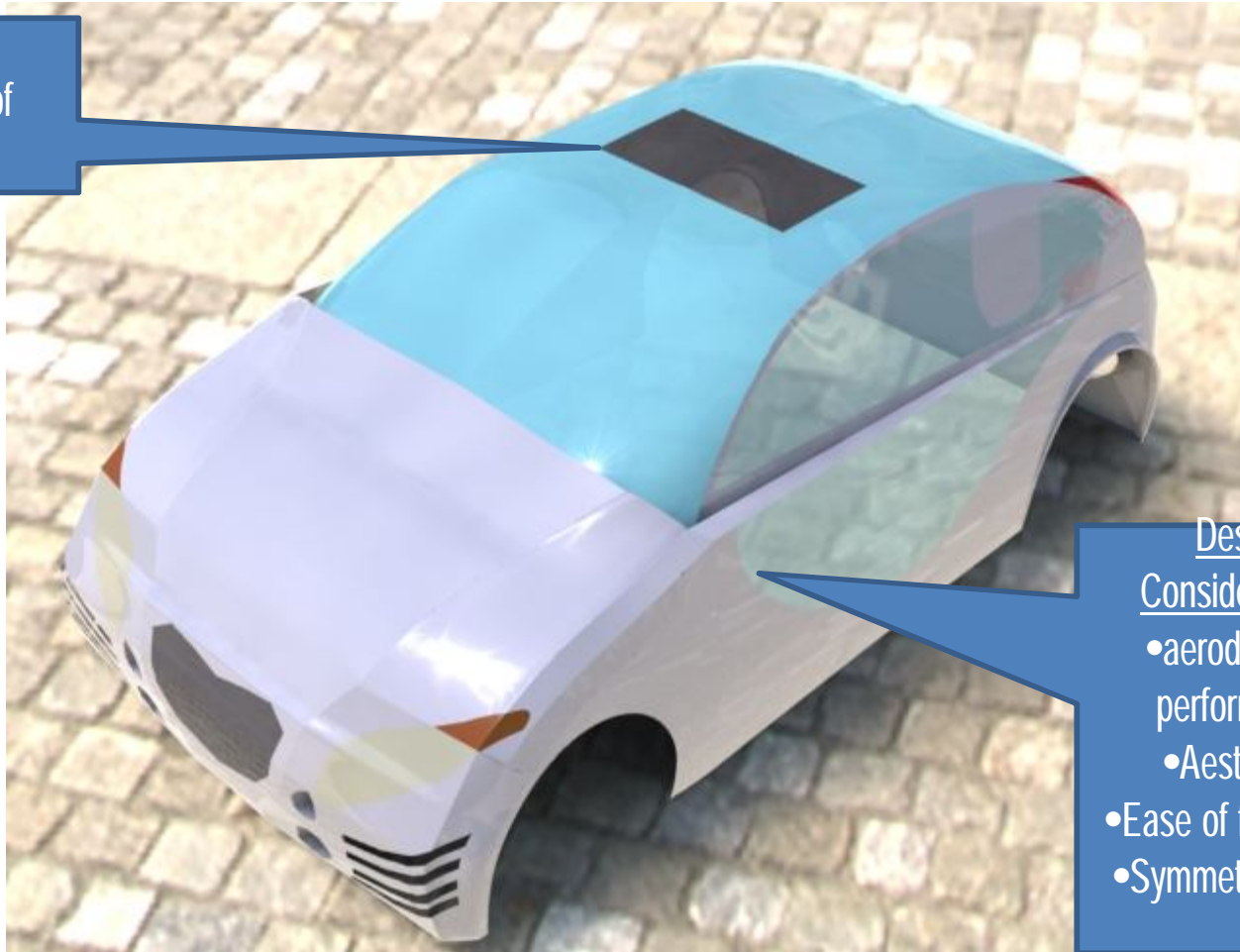


2 D body Design-Front View



Mechanical Systems- The 3D body Design

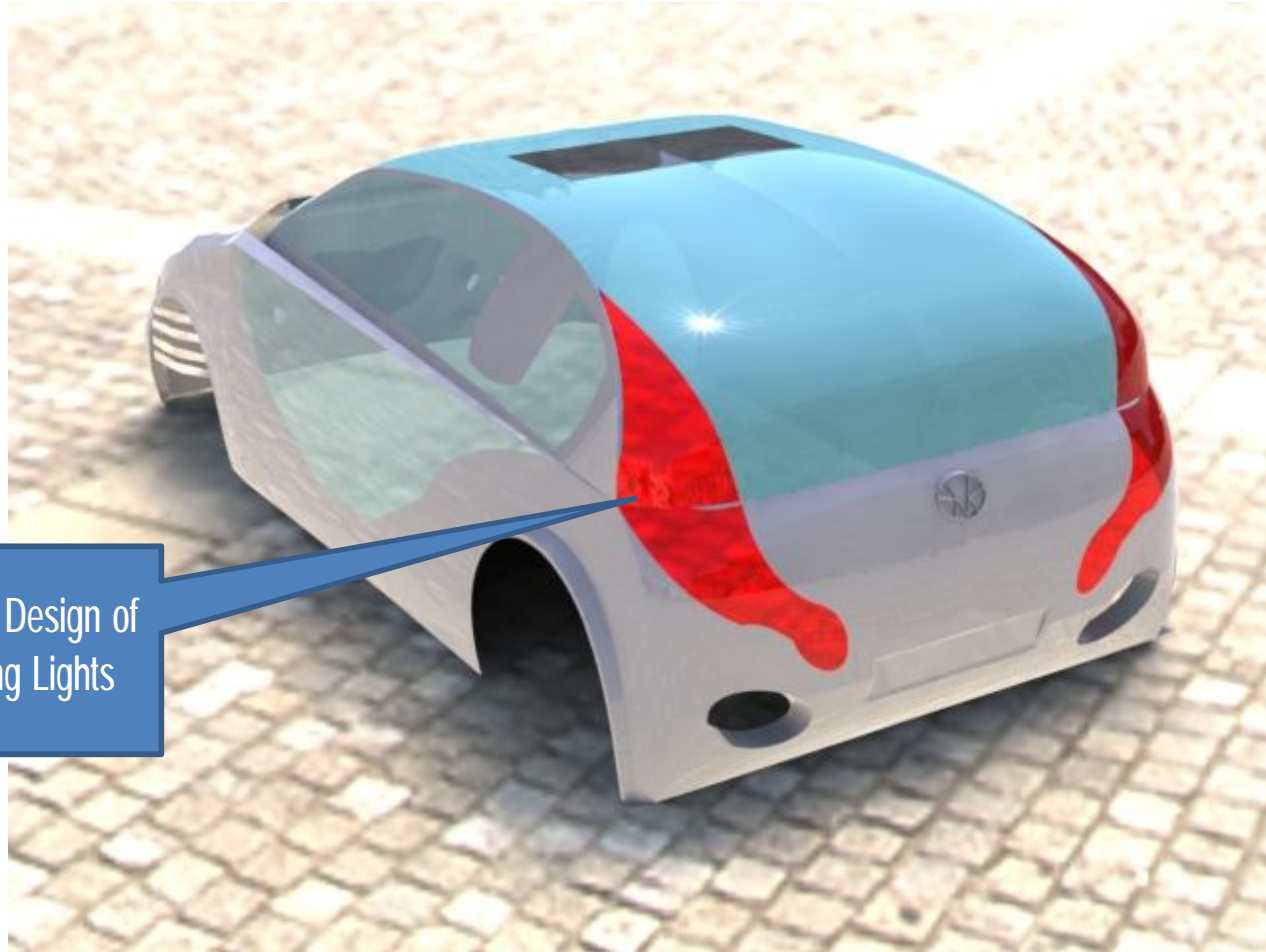
Glass Roof



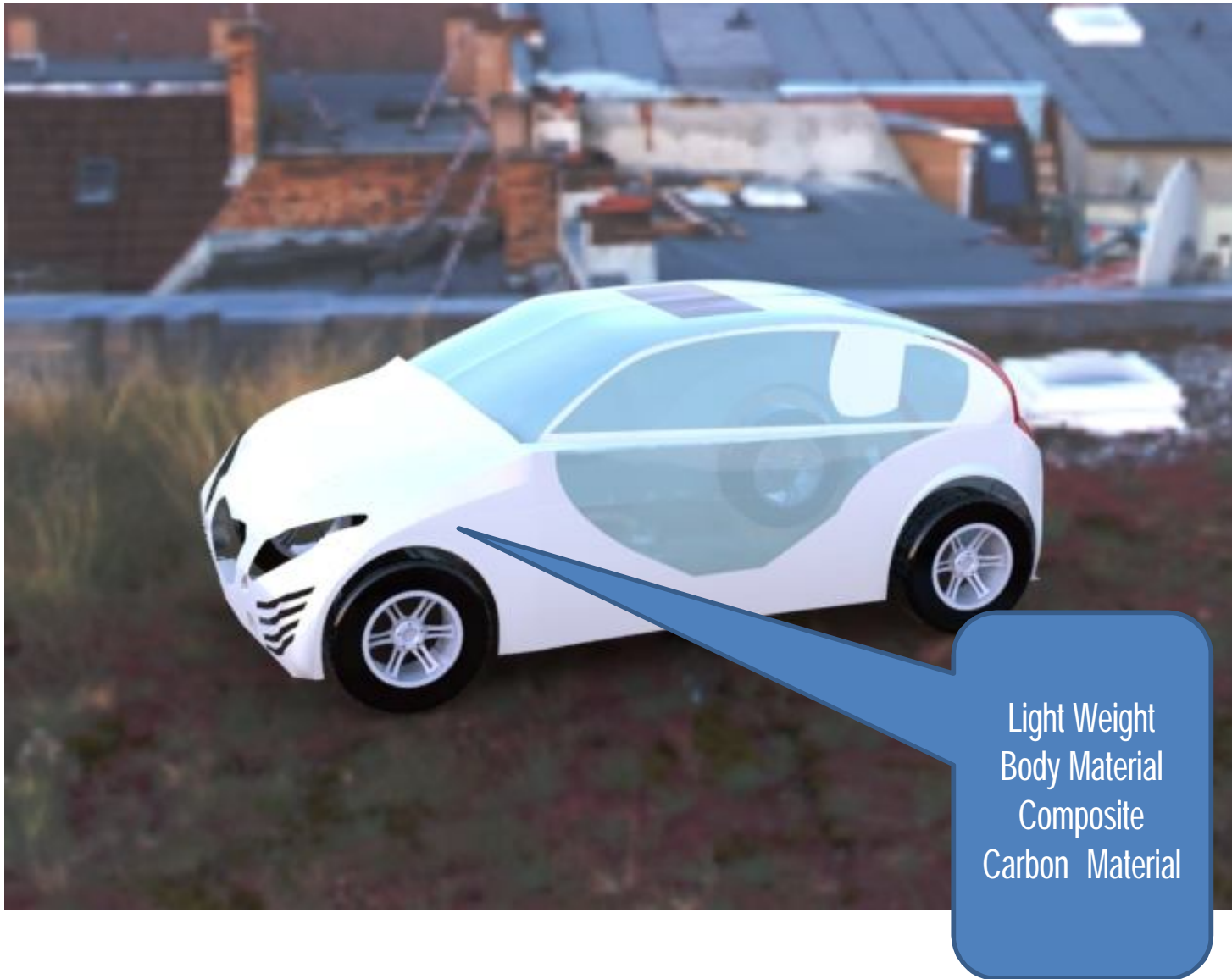
Design Considerations

- aerodynamic performance
- Aesthetics
- Ease of fabrication
- Symmetrical form

Body-Rear View

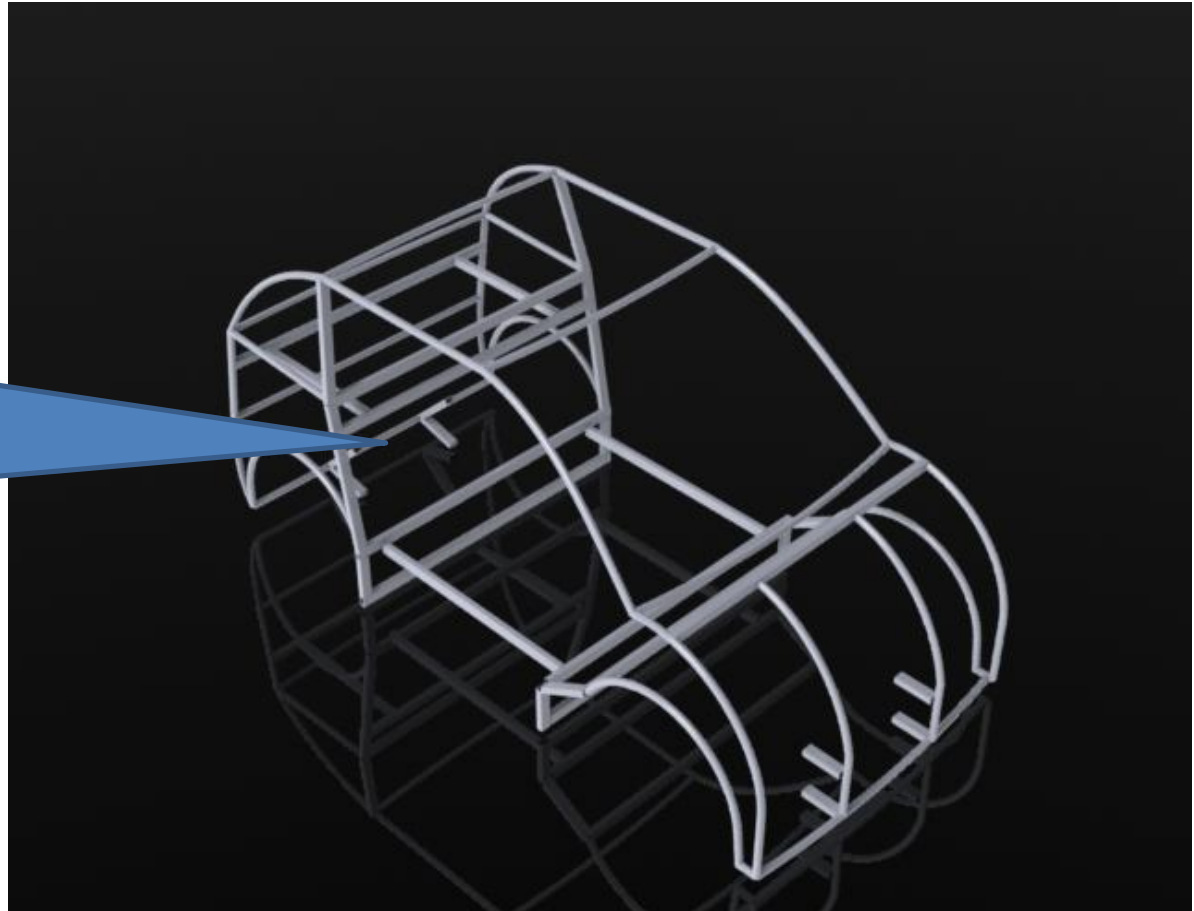


Unique Design of
Trailing Lights

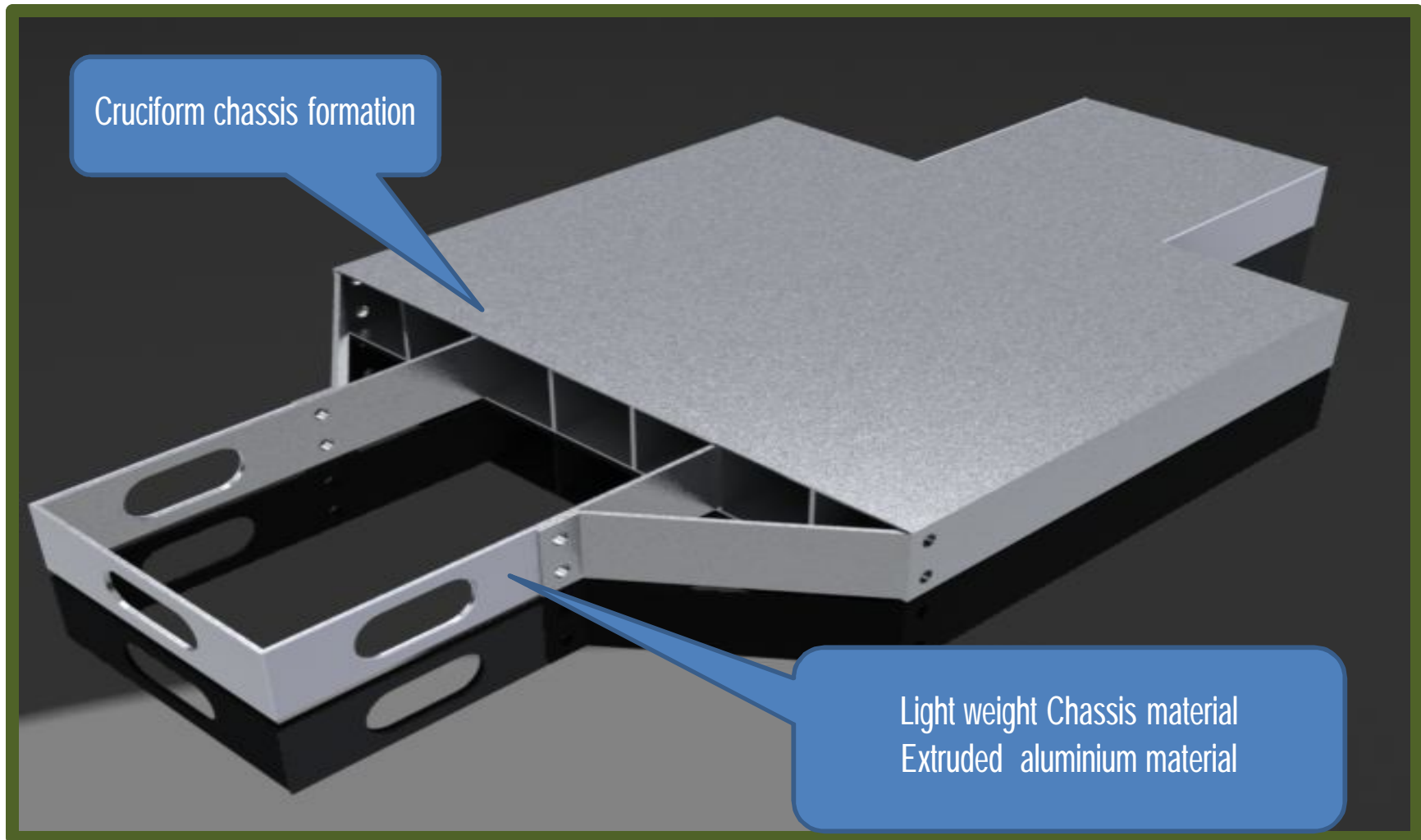


The Frame

Tubular Frame Design
for Light weight
(Square and circular
steel Tubes for
Strength)

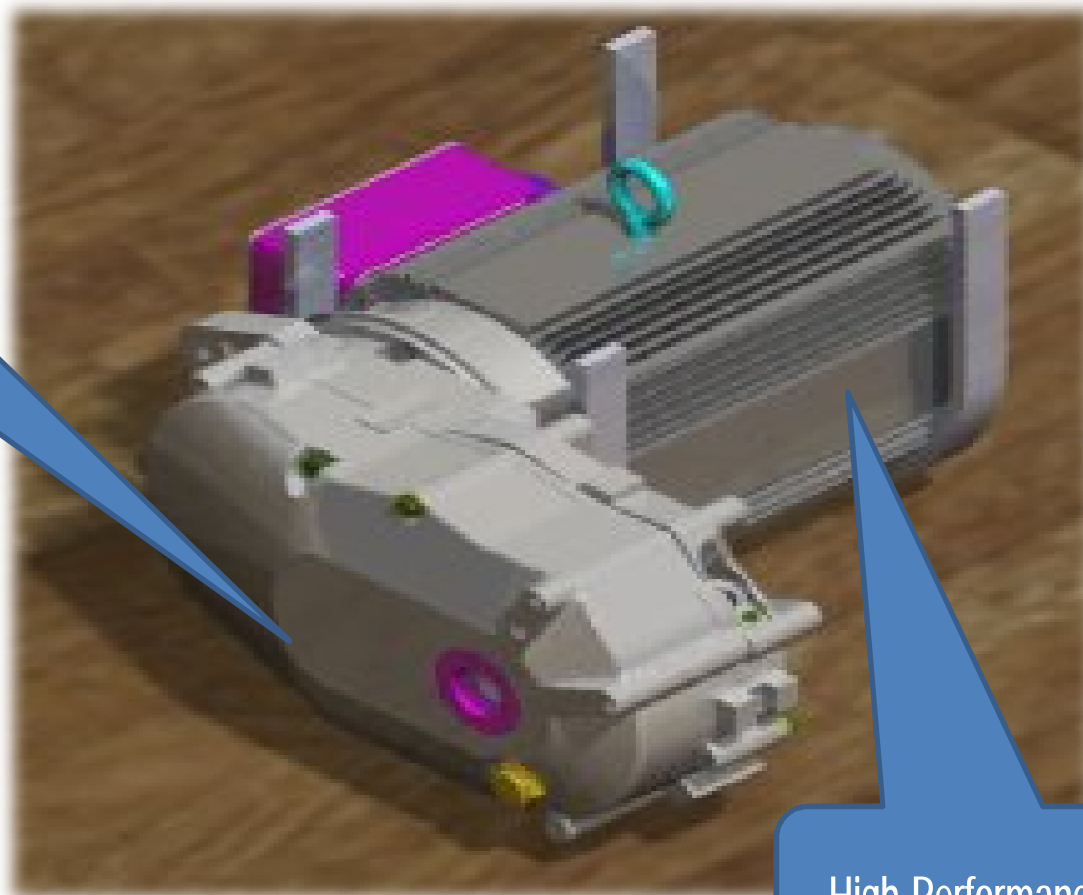


The Chassis



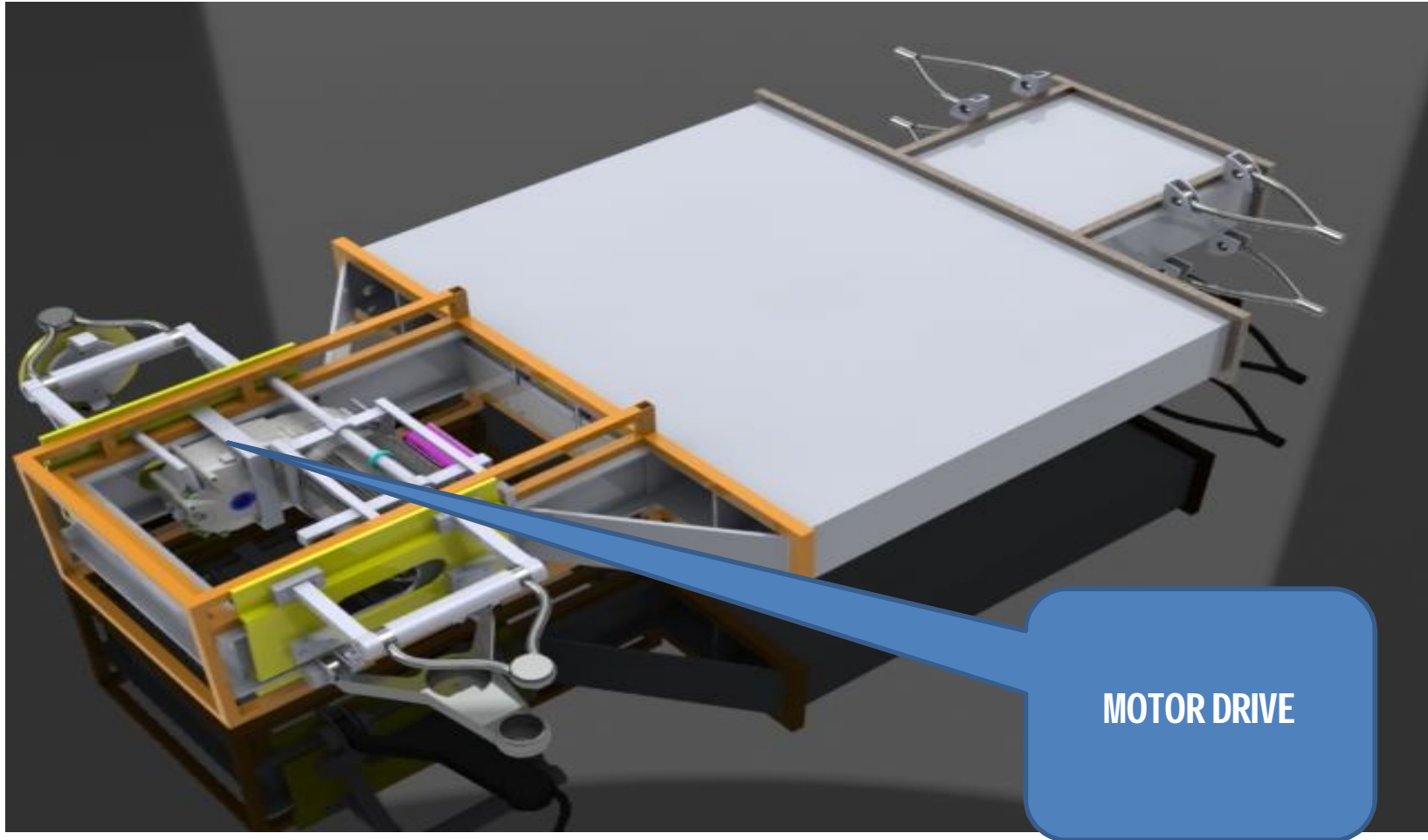
Motor Drive and Gear Assembly

Compact
reduction gear
and differential
Assembly

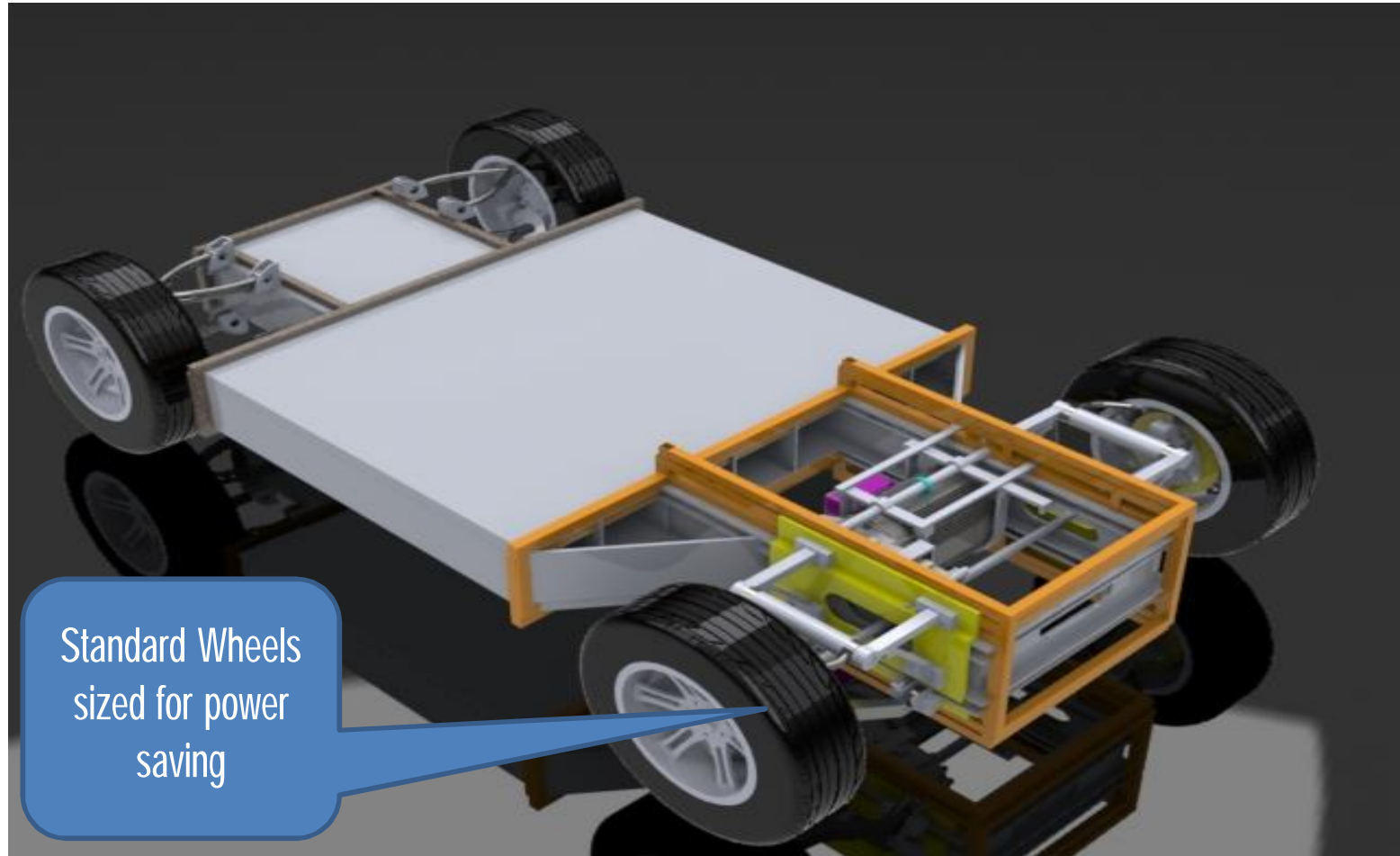


High Performance Induction Motor

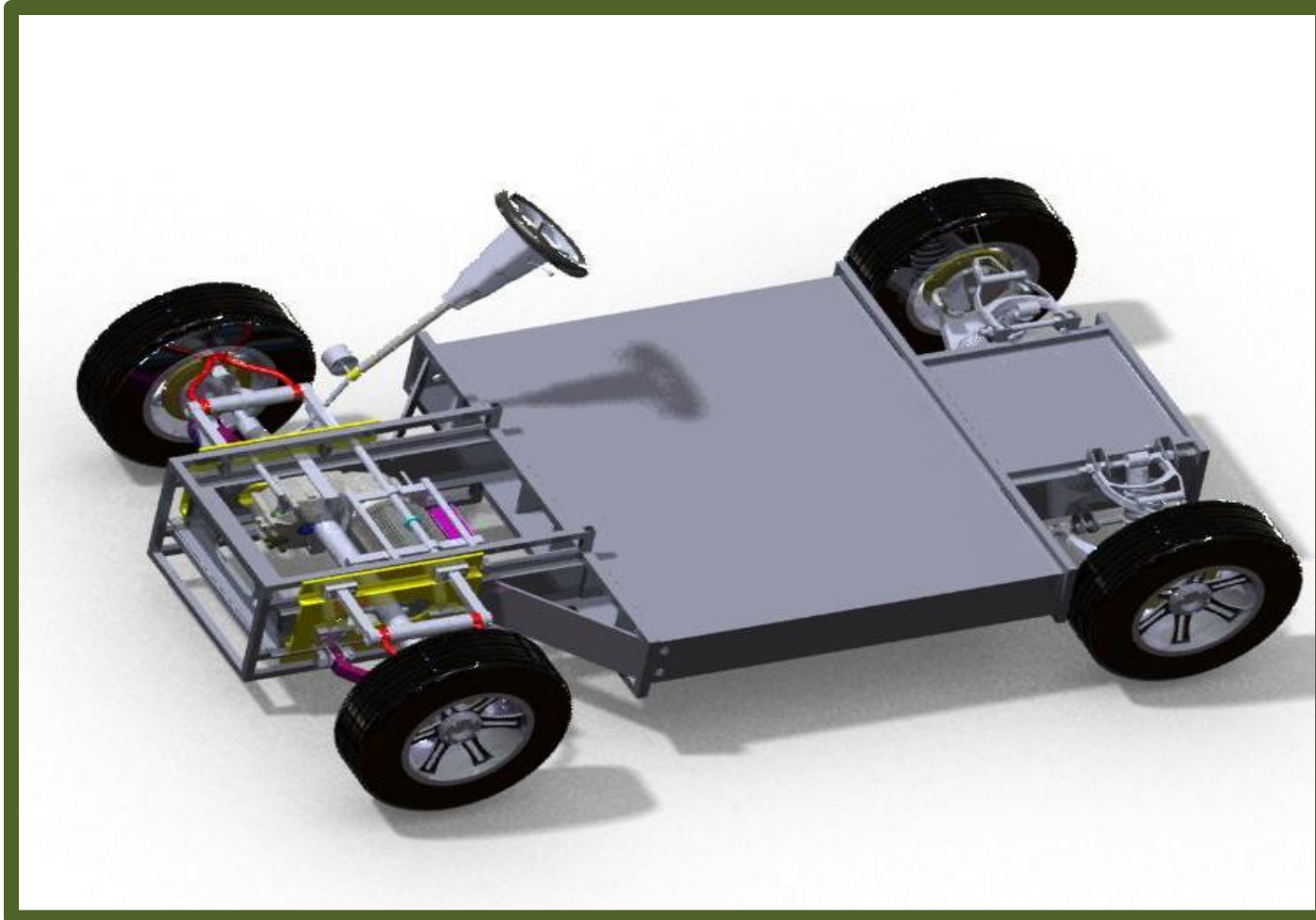
Motor Drive Assembly Into Chassis

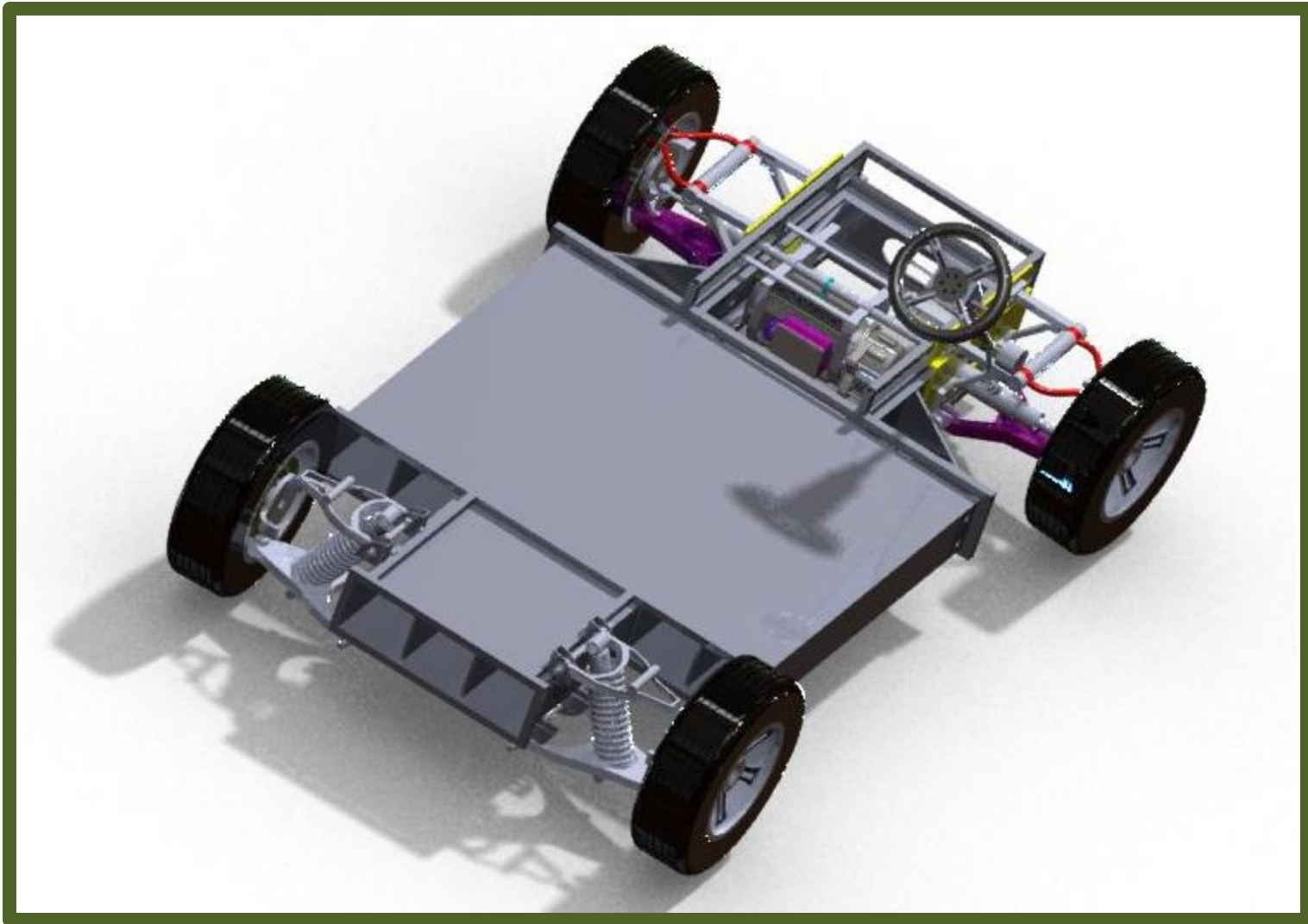


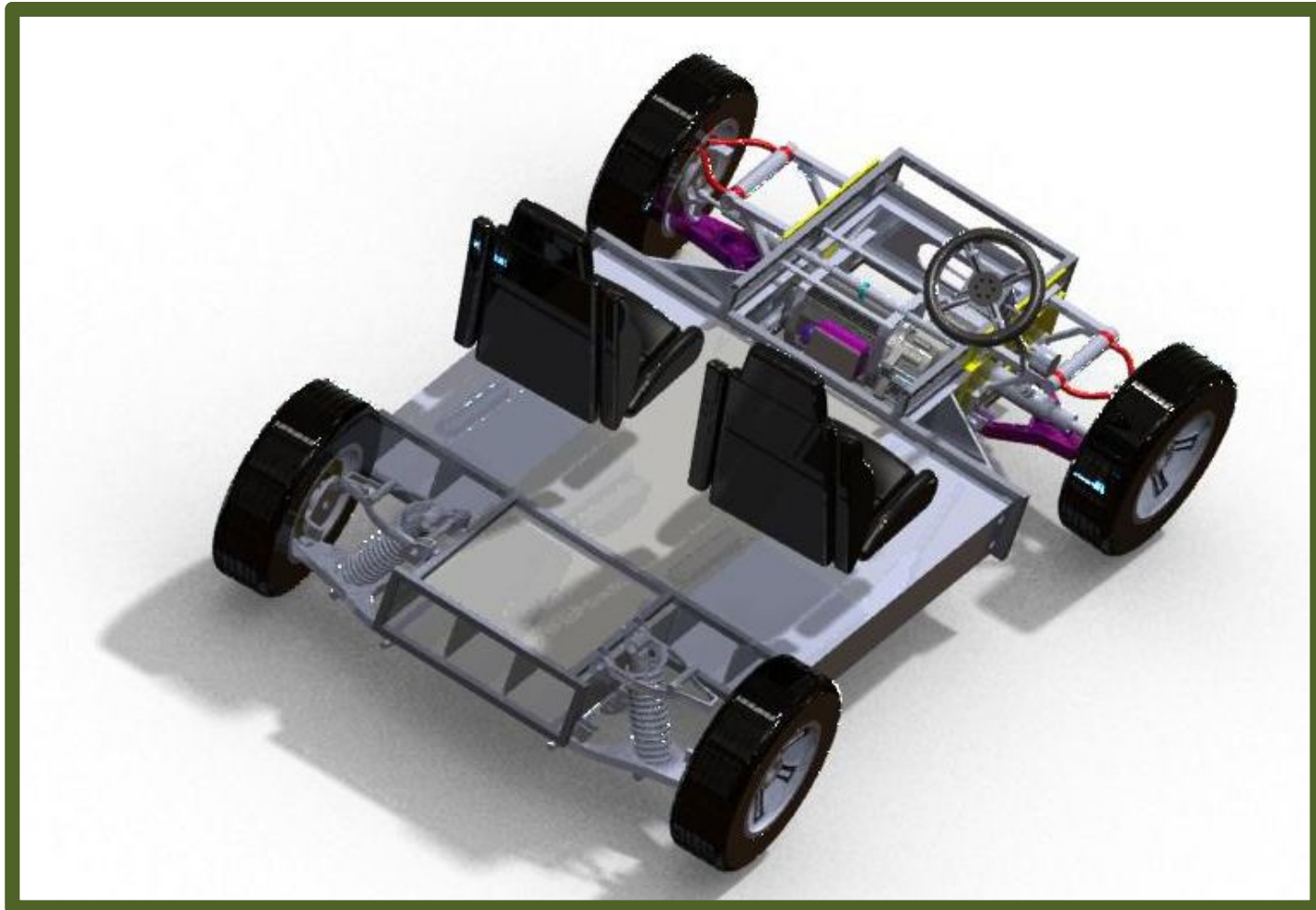
Drive and Wheel Assembly



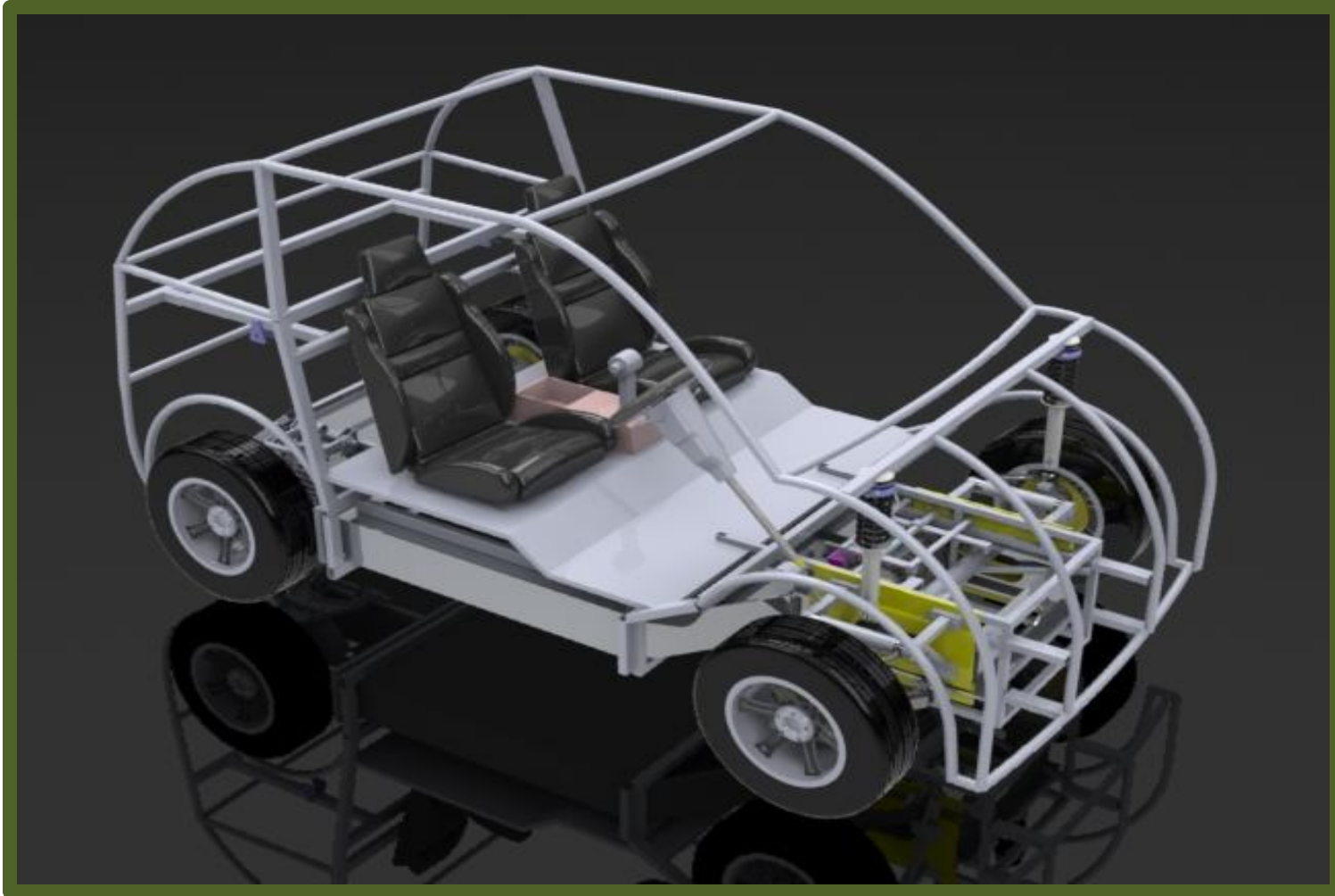
Steering System and Suspension Assembly





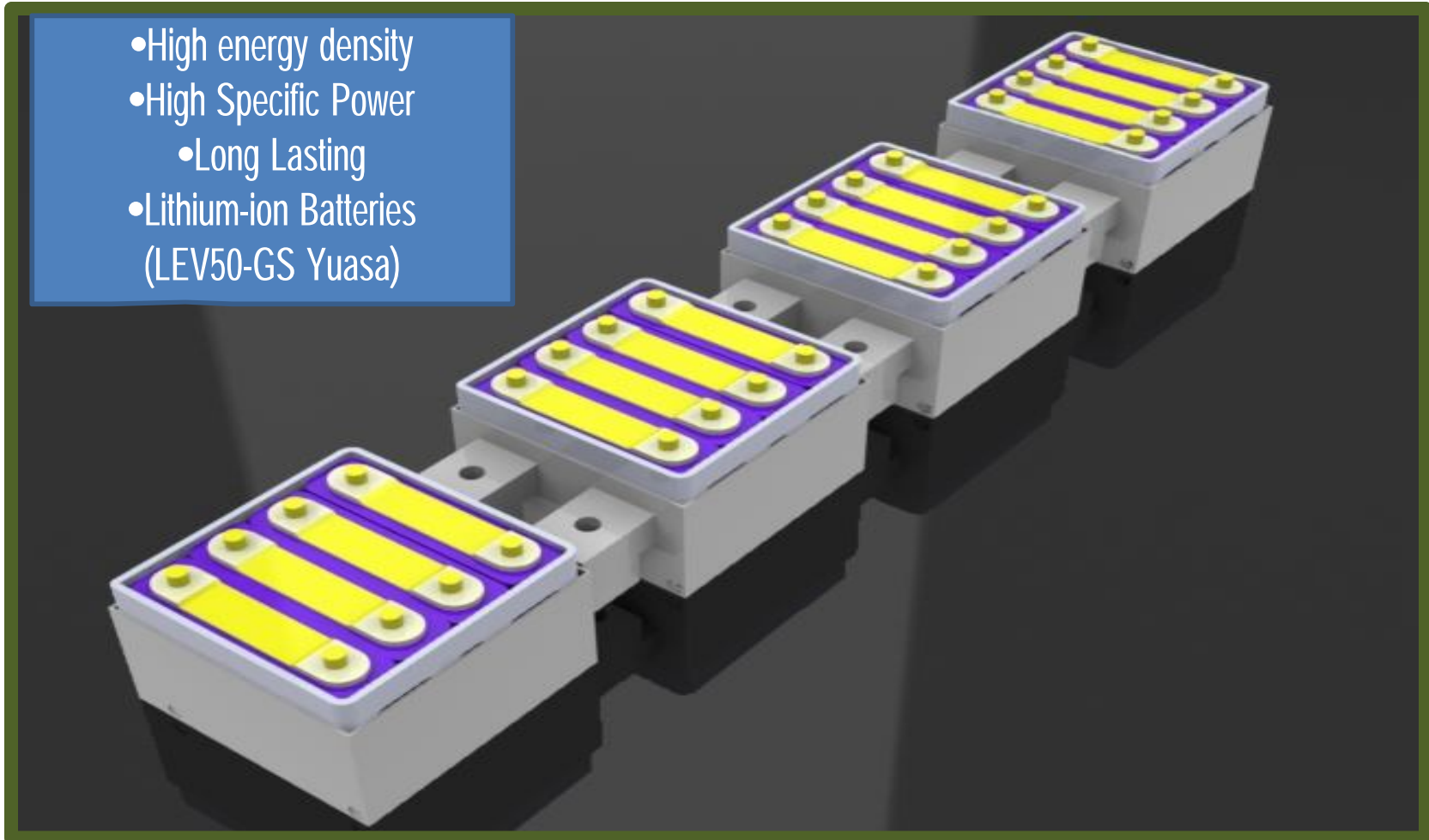


Chassis and Frame Assembly



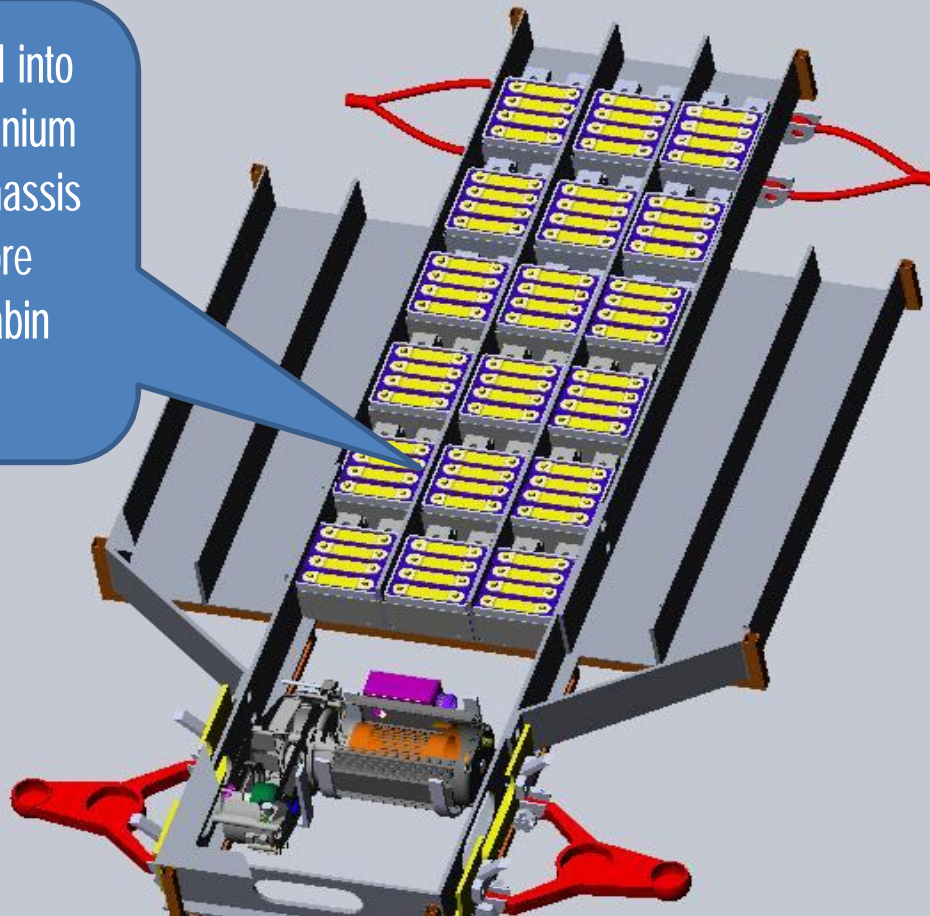
Energy Source –Lithium-ion Batteries

- High energy density
- High Specific Power
 - Long Lasting
- Lithium-ion Batteries (LEV50-GS Yuasa)



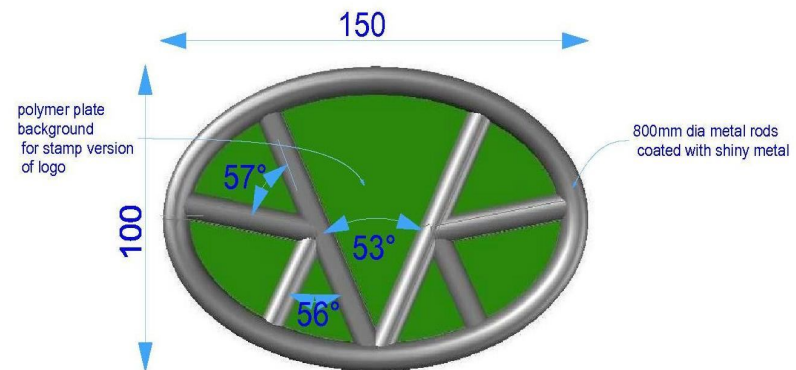
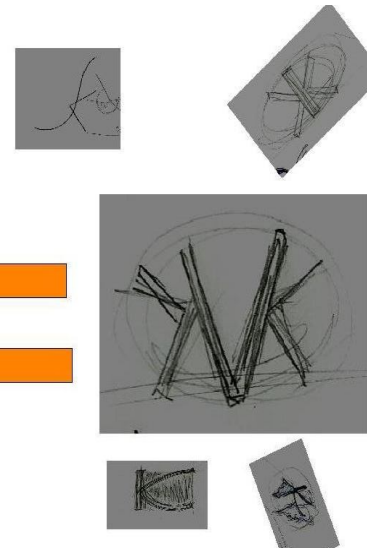
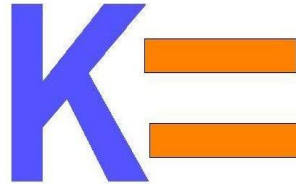
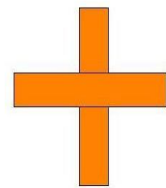
Energy Source Assembly

Batteries Fitted into
Extruded aluminium
tubes in the Chassis
Creating More
passenger cabin
space



KIIRA Flag

1.2 INSPIRATION



Mechanical Components Summary

Components	Type	Status
Body	Carbon Polymer	Not Covered
Frame	Tubular Steel Material	Covered Under procurement
Chassis	Extruded Aluminium Alloy	Covered Under Procurement
Wheel Assembly	Standard R14 wheels	Covered Under Procurement
Braking System	Friction and Regenerative Brakes	Covered Under Procurement
Steering System	Electric Power Steering	Covered Under Procurement
Suspension and Shock Absorbers	Spring suspension system	Covered Under Procurement

THANK YOU