

INTRODUCING

UNI-POLAR PROGRAMMED DUAL SUPERCAPACITOR SYSTEM

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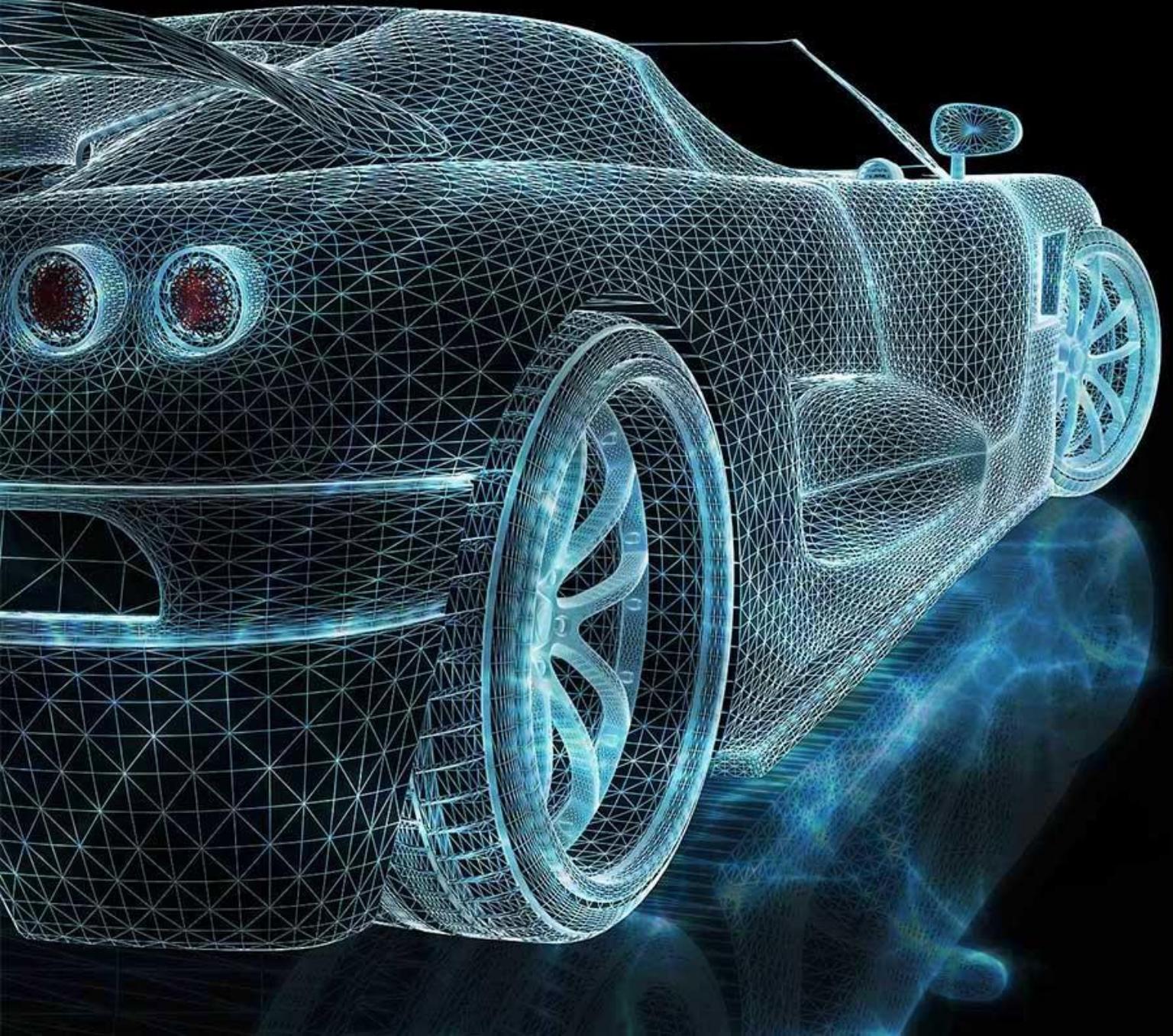
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Mohit Yadhuvanshi

Shubham Shankti

Electric Vehicles

ELECTRIC VEHICLES



Charging Time



Speed & Range



Energy Density



Price

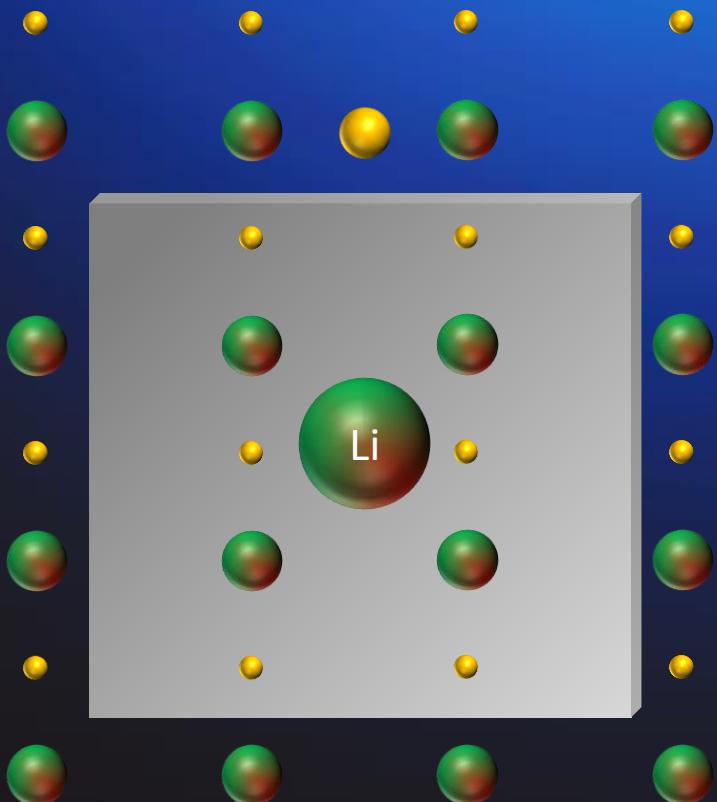


Non-Recyclable

Atomic mass: 11.6×10^{-27} kg

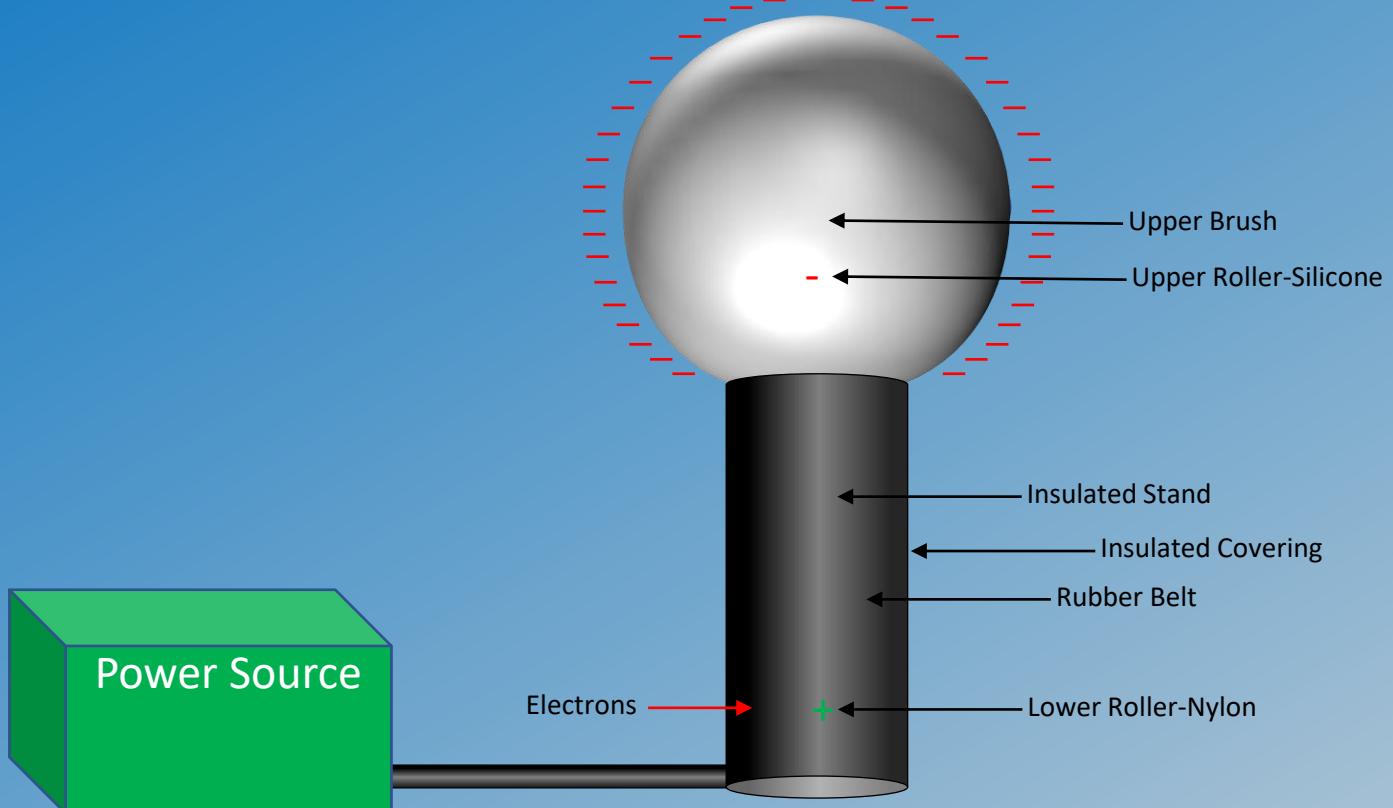
Atomic radius: 167×10^{-12} m

H	
Li	Be

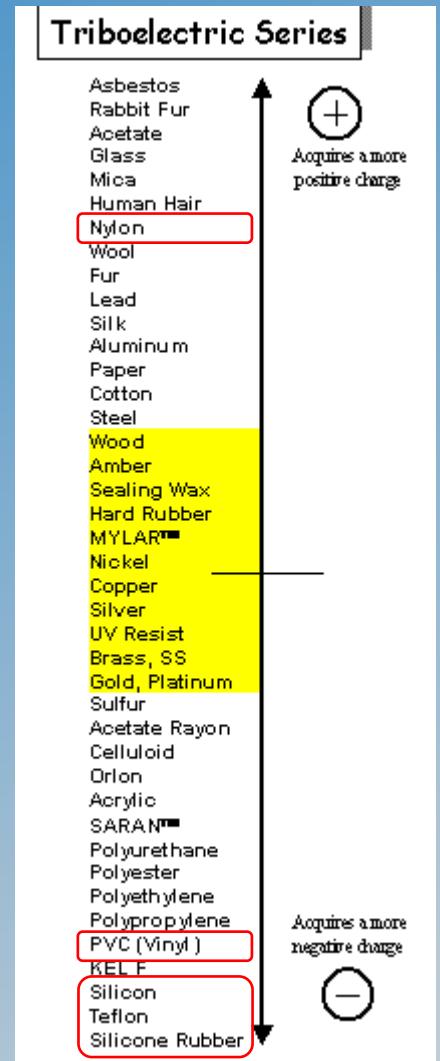


Net Charge: $1 e^- = 1.6 \times 10^{-19}$ C





Statically isolated charge Technique



Capacitance (C) = $4\pi\epsilon_m r$

$$C = 4 \times 3.14 \times (2.2125 \times 10^{-6}) \times 1$$

$$C = 2.7789 \times 10^{-5} \text{ F}$$

For Rubber Fiber

$$\begin{aligned}\epsilon_m &= \epsilon_0 \times \epsilon_r \\ &= 8.85 \times 10^{-12} \times 250000 \\ &= 2.2125 \times 10^{-6} \text{ F m}^{-1}\end{aligned}$$

$$C = 2.7789 \times 10^{-5} \text{ F}$$

$$\text{Energy (U)} = \frac{CV^2}{2}$$

$$U = 2.7789 \times 10^{-5} \times (62,85,000)^2 / 2$$

$$U = 54,88,49,770.76 \text{ joules}$$

$$U = 152.45 \text{ kwh}$$

For a Shell of radius 1m

$$A = 4\pi r^2$$

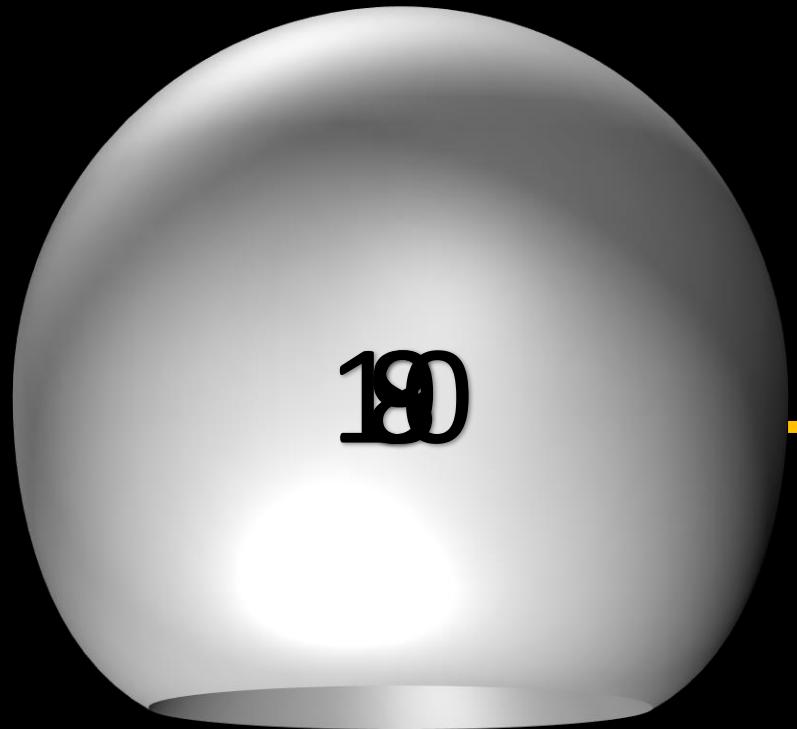
$$= 4 \times 3.14 \times 1^2$$

$$= 12.57 \text{ m}^2$$

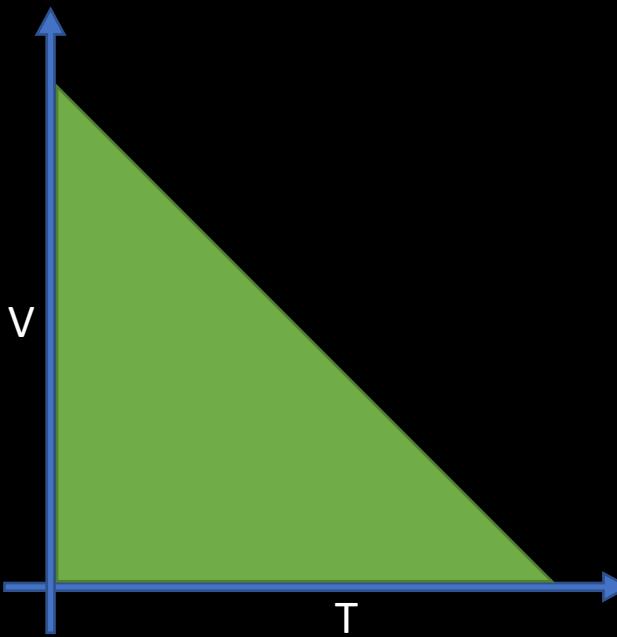
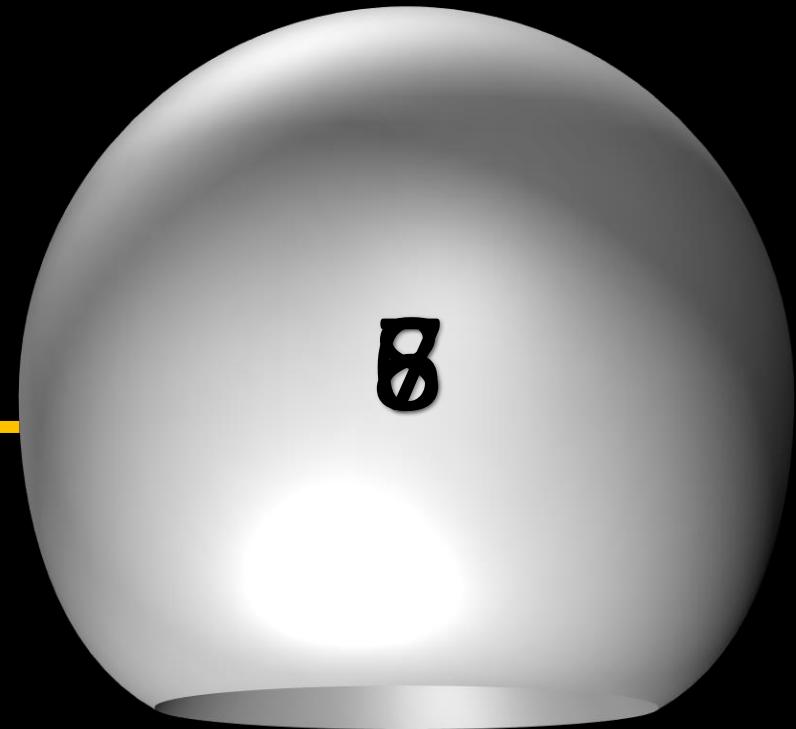
$$1 \text{ m}^2 \longrightarrow 5,00,000 \text{ volts}$$

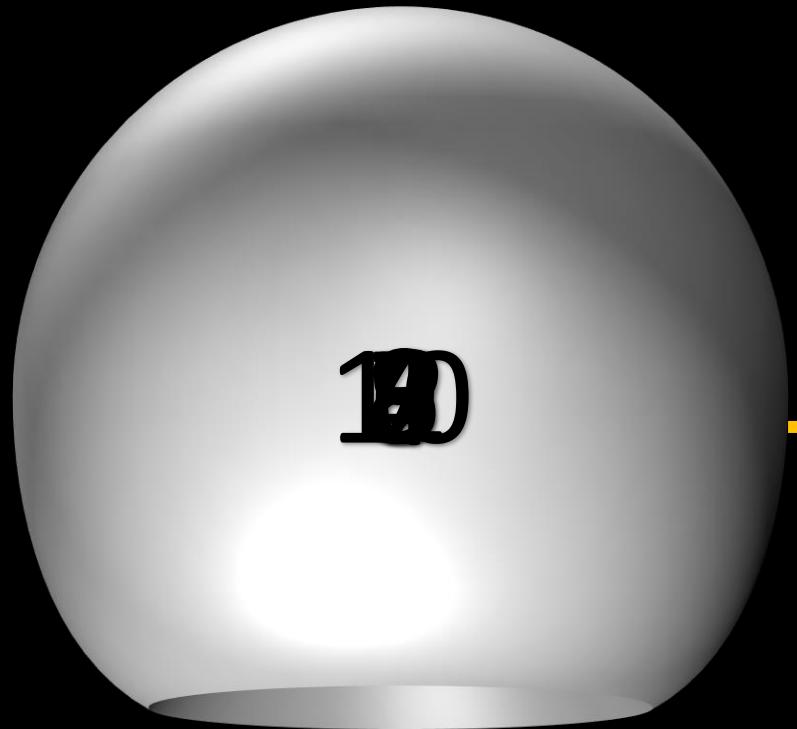
$$12.57 \text{ m}^2 \longrightarrow V \text{ volts}$$

$$V = 62,85,000 \text{ volts}$$

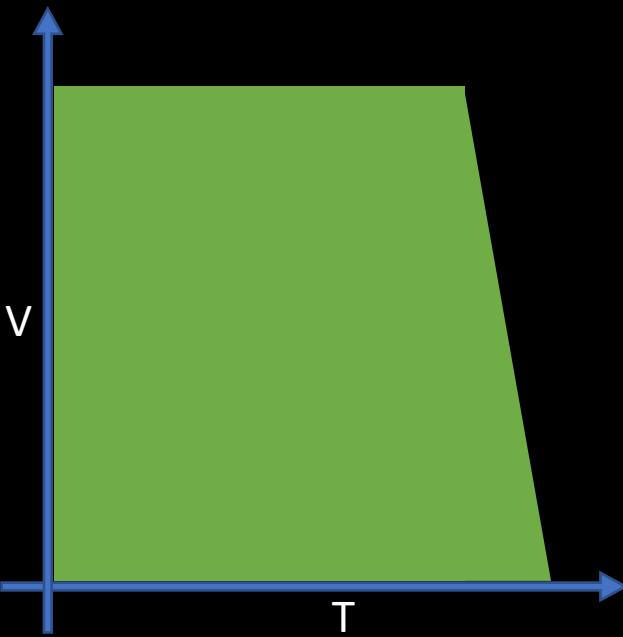
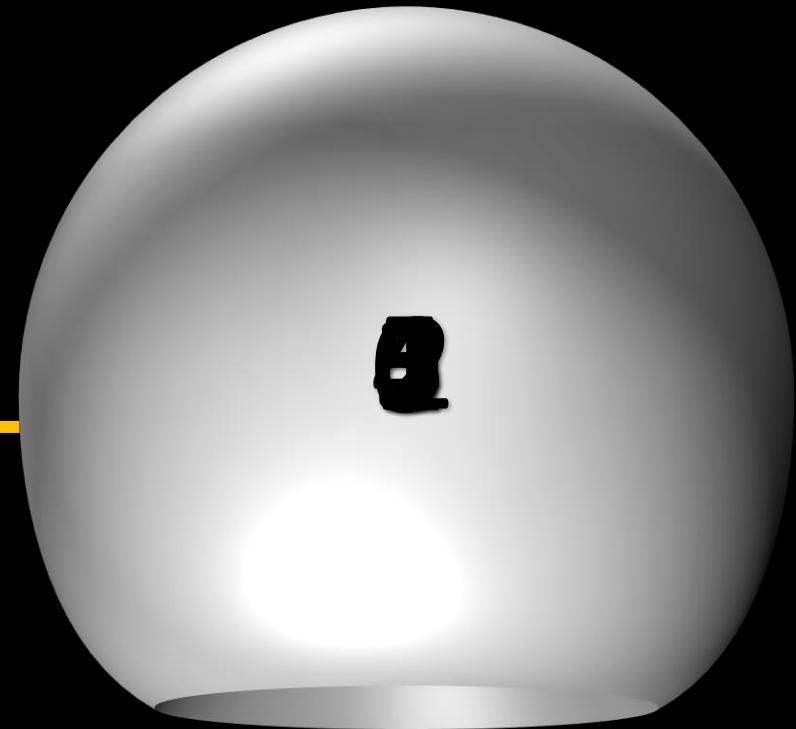


Qv



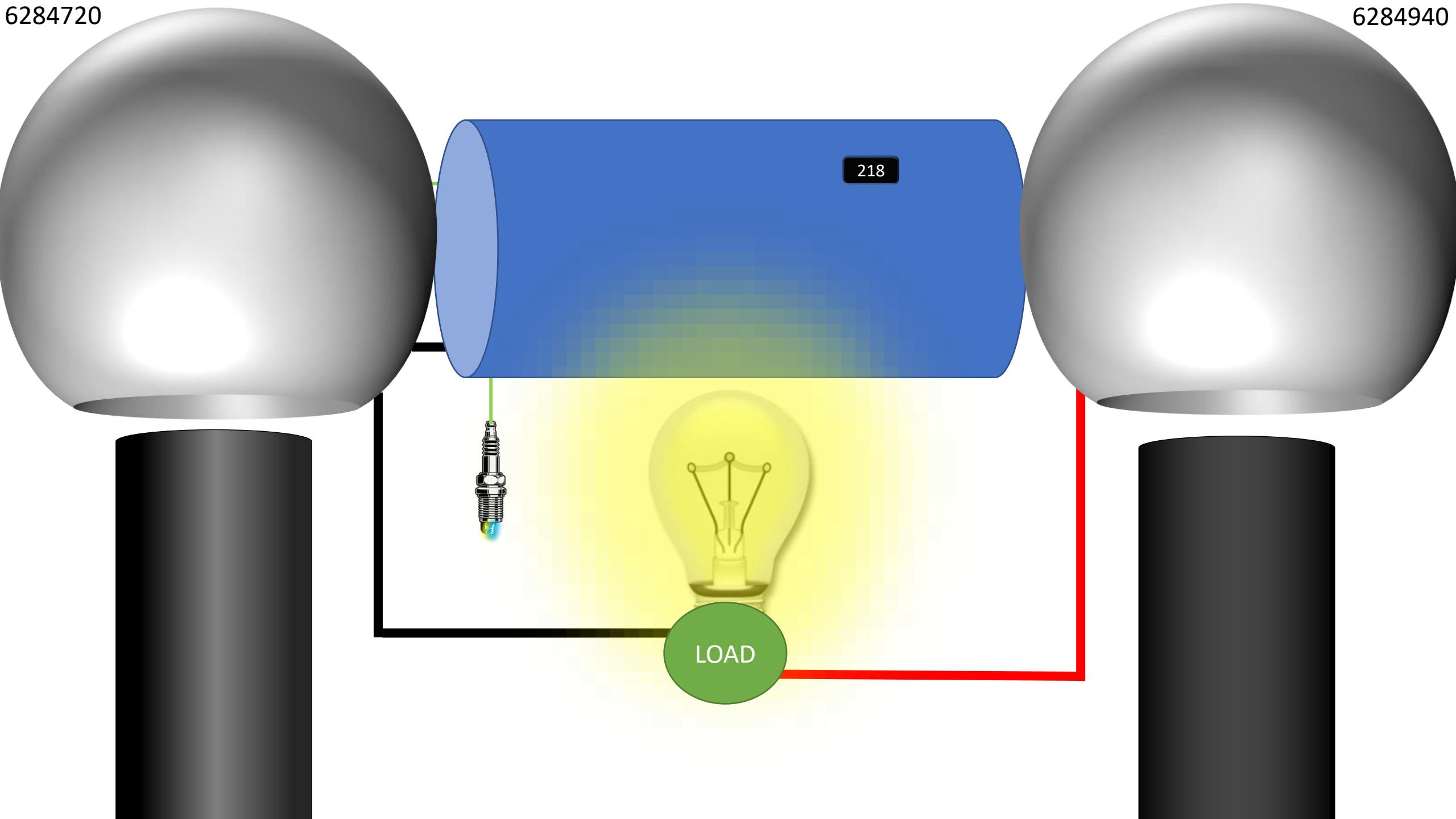


∂v



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6284940



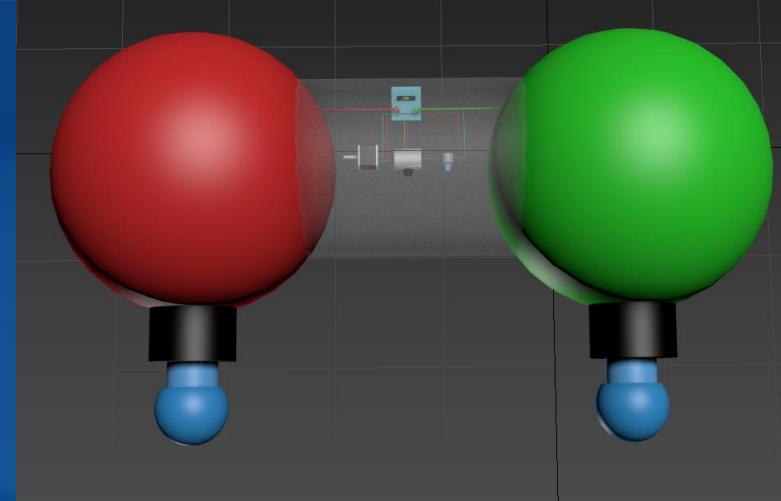
$$\text{Density of Al} = 2700 \text{ kg m}^{-3}$$

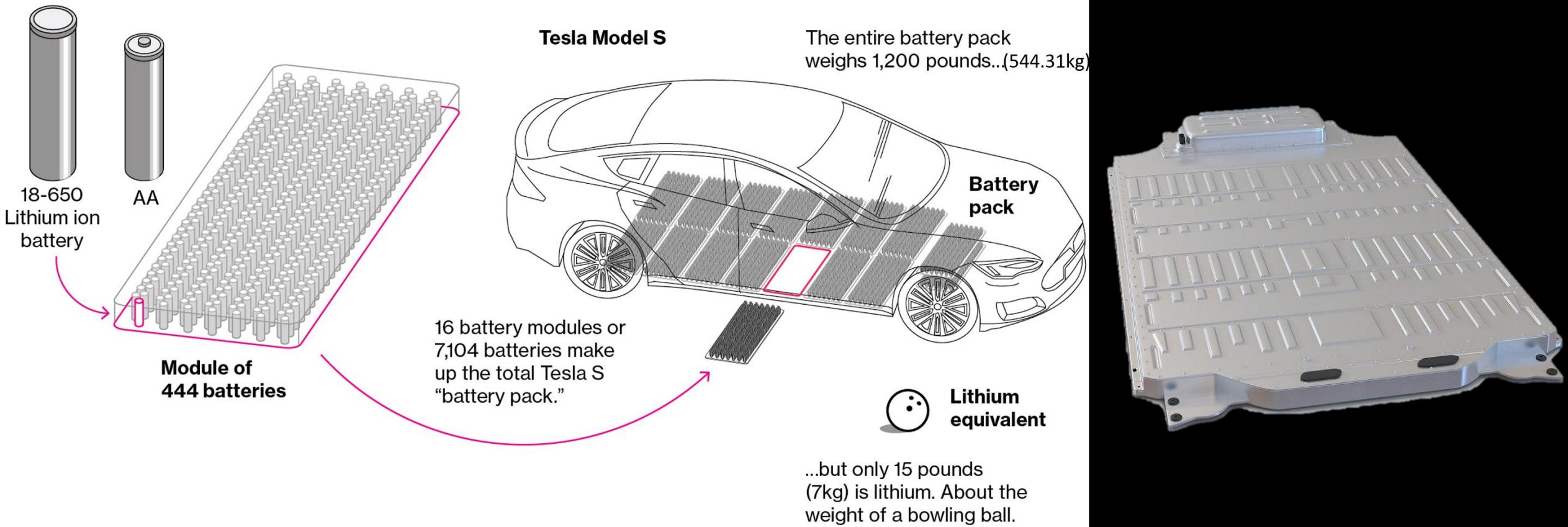
$$\begin{aligned}\text{Mass of ESE-shells} &= \rho V \\&= \rho(V_2 - V_1) \\&= \rho\left(\frac{4}{3}\pi r_2^3 - \frac{4}{3}\pi r_1^3\right) \\&= \frac{4}{3}\pi\rho(r_2^3 - r_1^3) \\&= \frac{4}{3}\pi\rho(1^3 - (0.995)^3) \\&= \frac{4}{3}\pi\rho(1 - 0.985) \\&= \frac{4}{3}\pi\rho \times 2700 \times 0.015 \\&= 169.64 \text{ kg}\end{aligned}$$

$$\text{Density of CCTO} = 4700 \text{ kg m}^{-3}$$

$$\begin{aligned}\text{Mass of ESE-shells} &= \rho V \\&= \rho(V_2 - V_1) \\&= \rho\left(\frac{4}{3}\pi r_2^3 - \frac{4}{3}\pi r_1^3\right) \\&= \frac{4}{3}\pi\rho(r_2^3 - r_1^3) \\&= \frac{4}{3}\pi\rho((1.005)^3 - 1^3) \\&= \frac{4}{3}\pi\rho(1.1507 - 1) \\&= \frac{4}{3}\pi\rho \times 4700 \times 0.1507 \\&= 296.64 \text{ kg}\end{aligned}$$

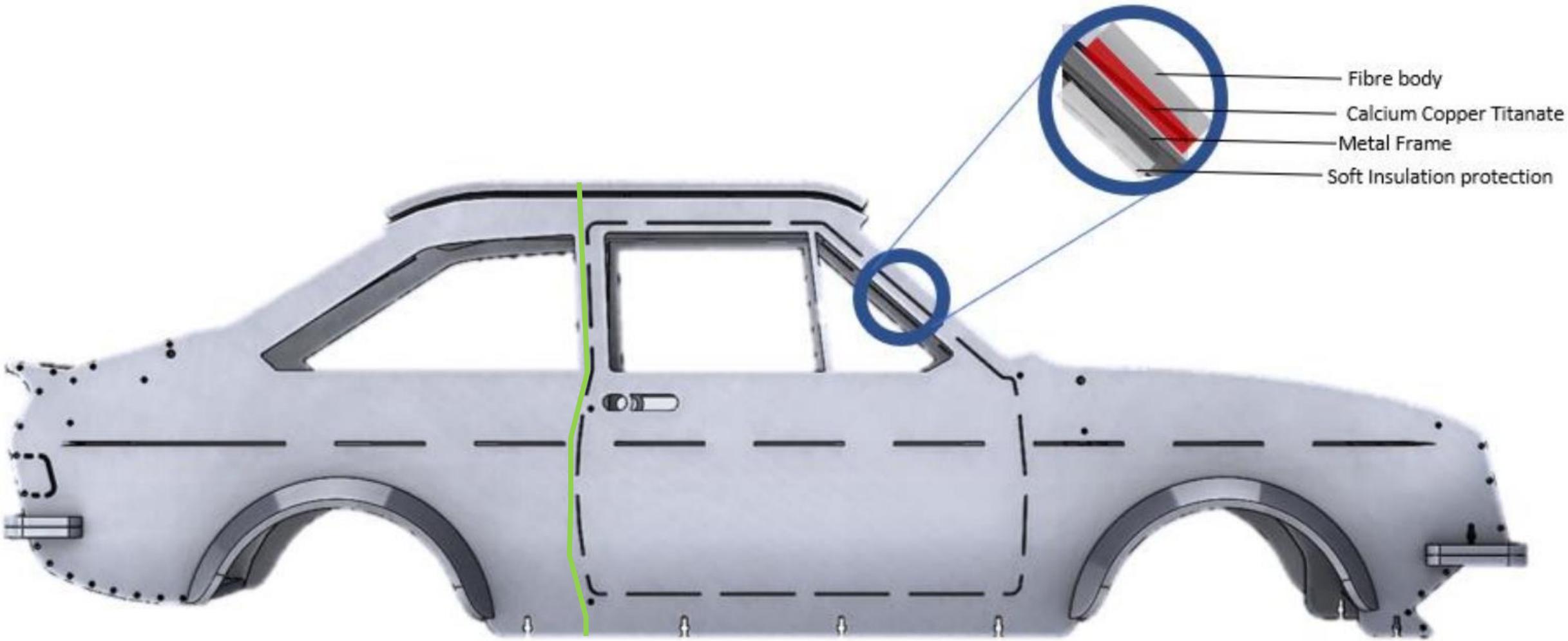
$$\text{Energy Density ESE} = \frac{152450}{466.28}$$
$$= 326.94 \text{ wh/kg}$$

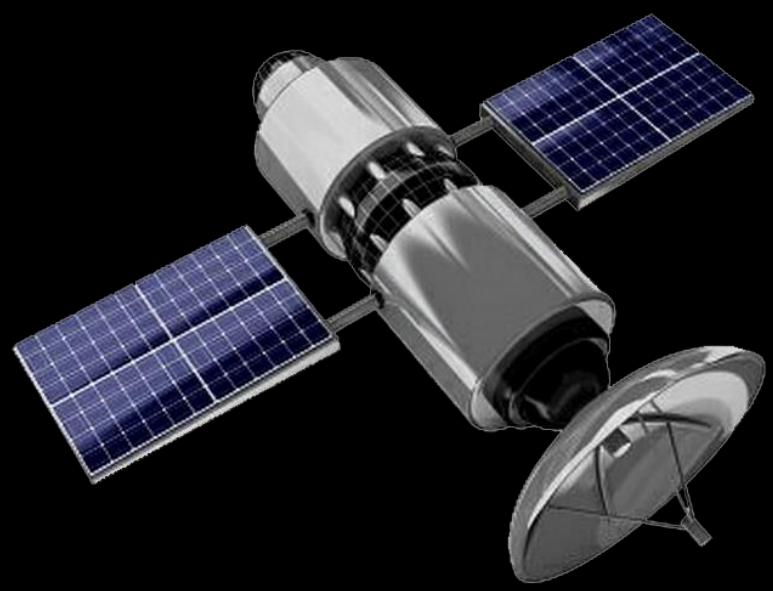




$$\begin{aligned} \text{Energy Density (Tesla S)} &= \frac{95000\text{wh}}{544.31\text{kg}} \\ &= 174.53 \text{ wh/kg} \end{aligned}$$

Body-Integrated Storage





Pros

- Increased Range & Power
- Faster Charging Rate
- Long Life Cycles
- Higher Energy Density
- Space Efficient (Body Integrated)
- Pollution Free
- Highly Versatile & Customizable

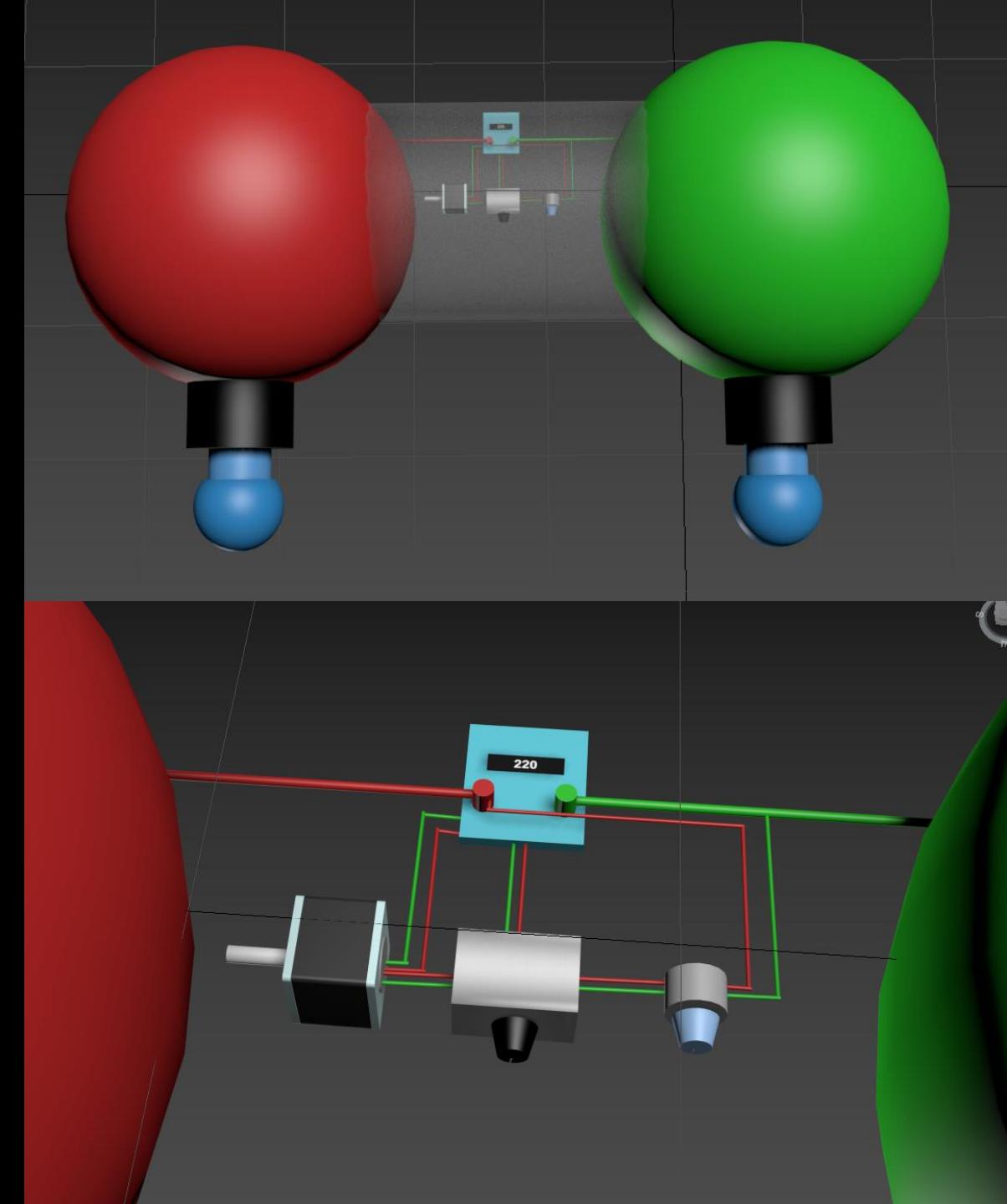
Cons

- Internal Humidity Contact
- Rupture Discharge

Phase-1:

- Working Prototype
- Concept Proving

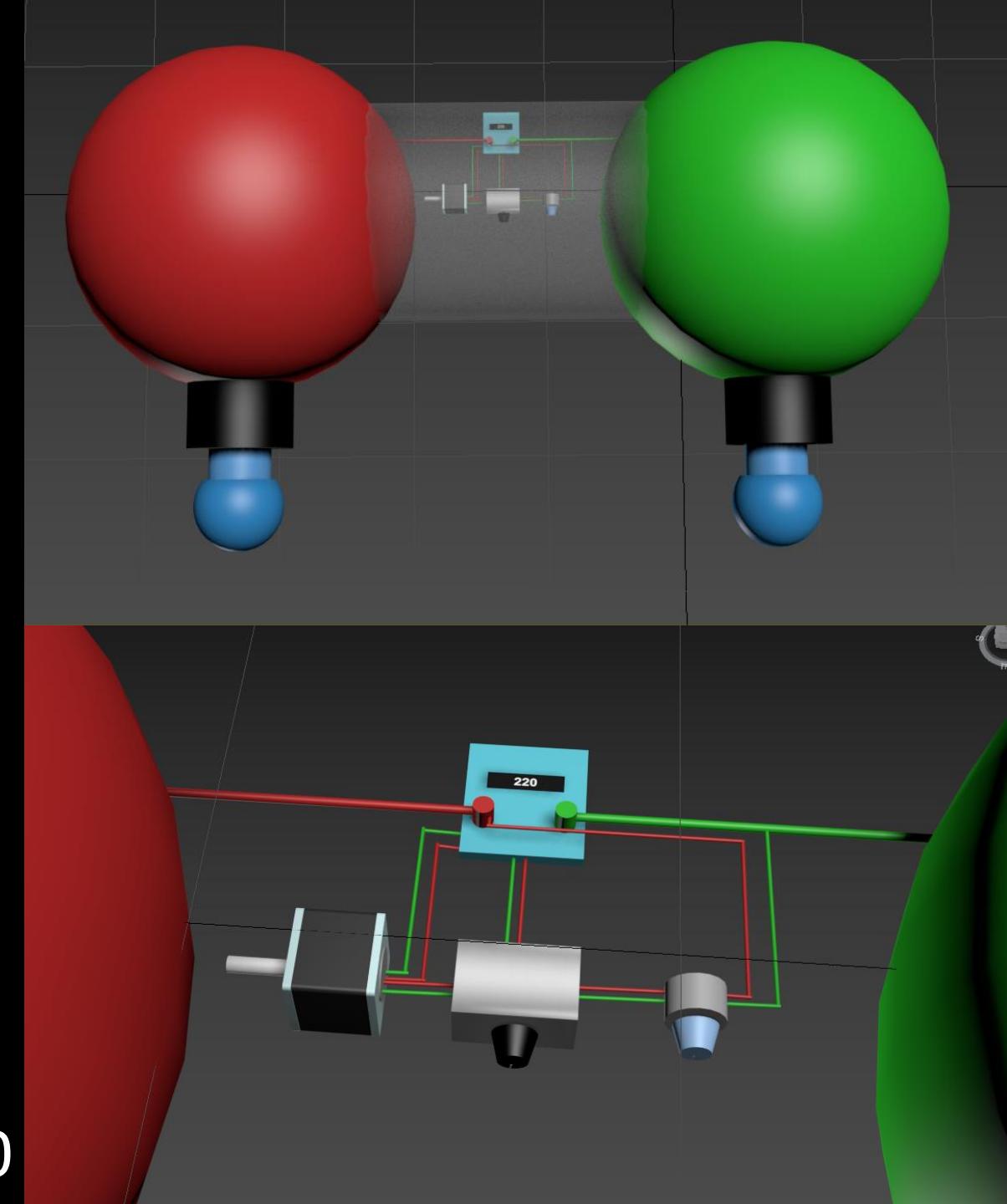
Budget Estimate: 80000

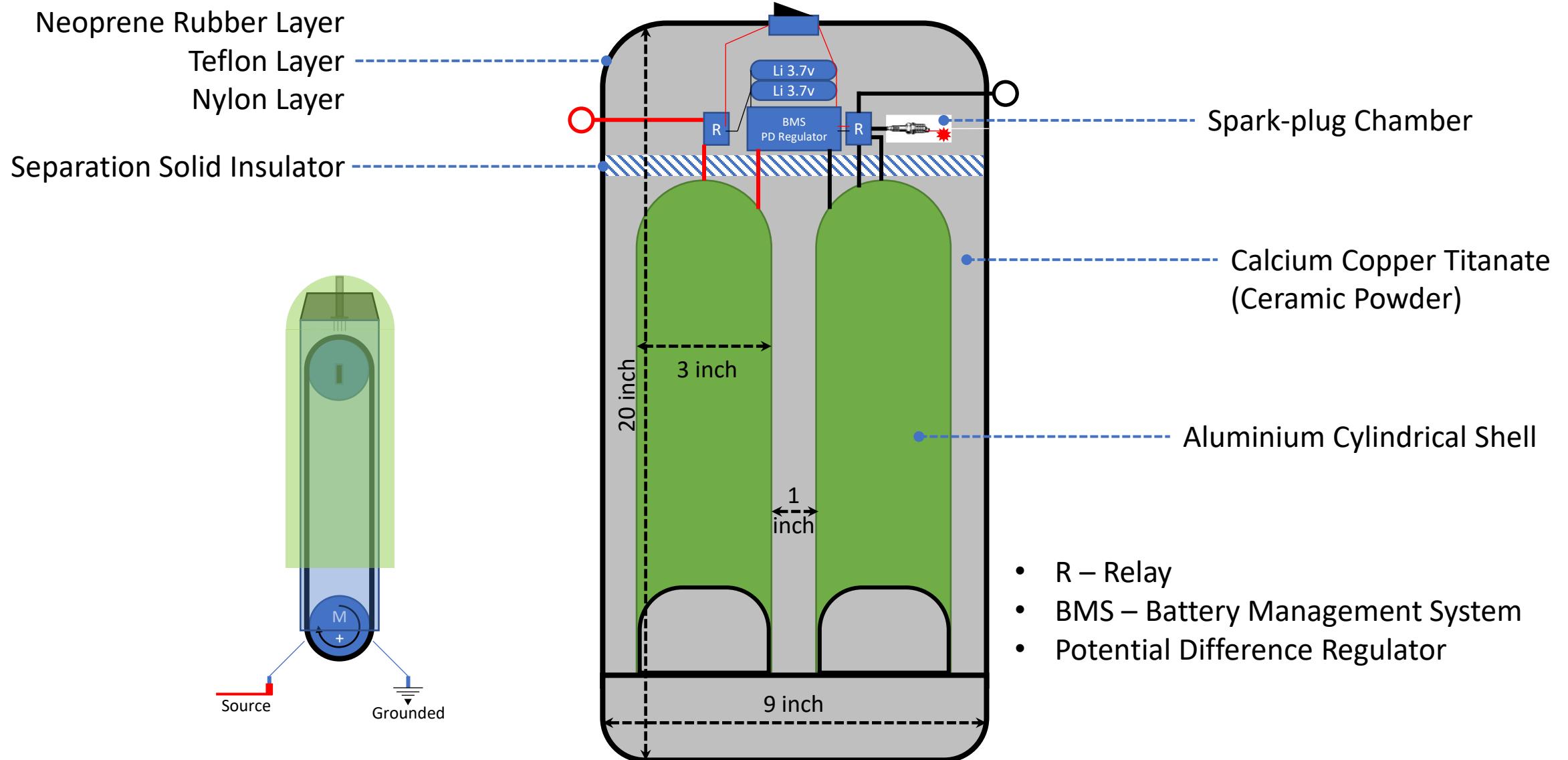


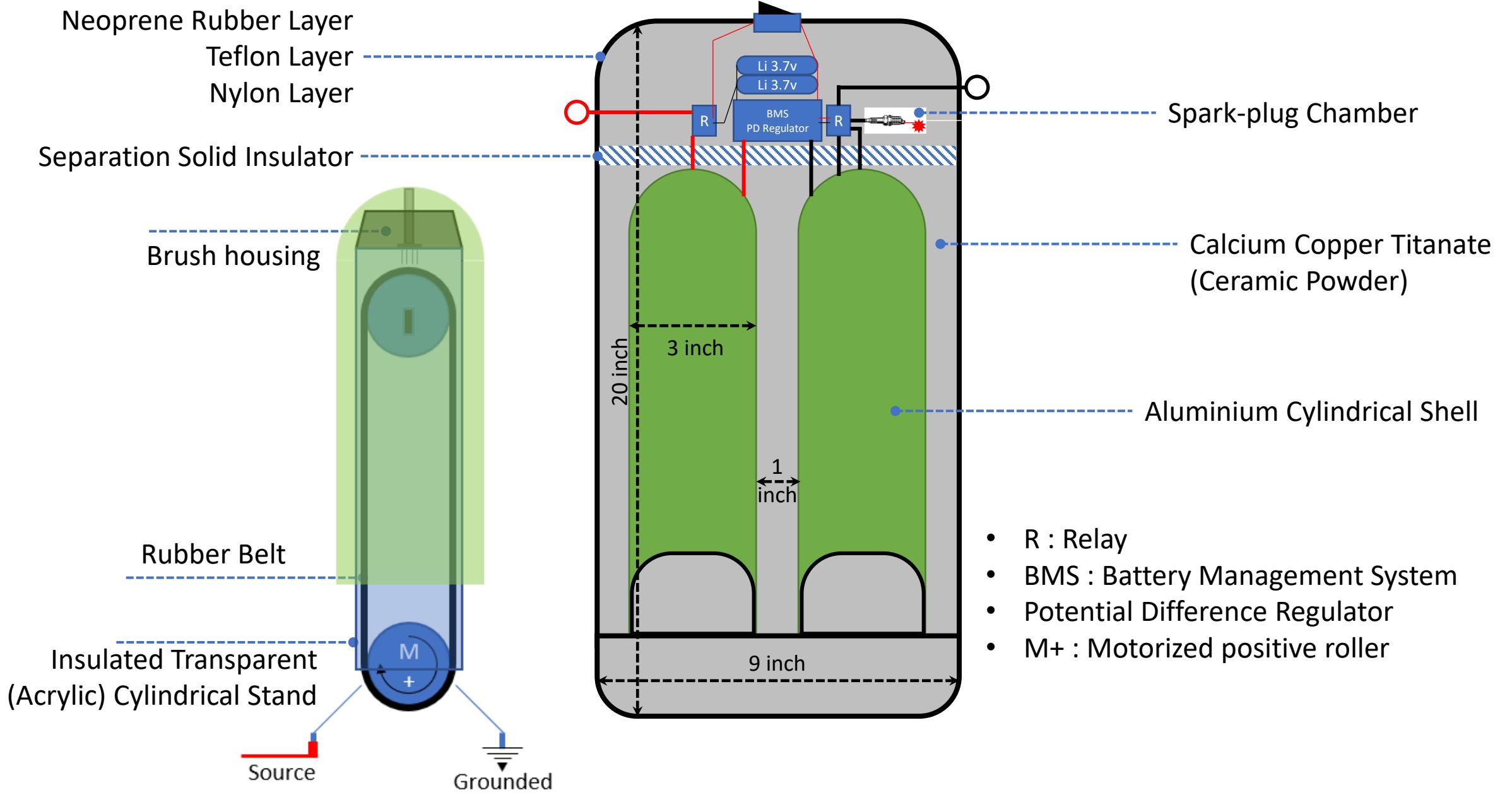
Phase-2:

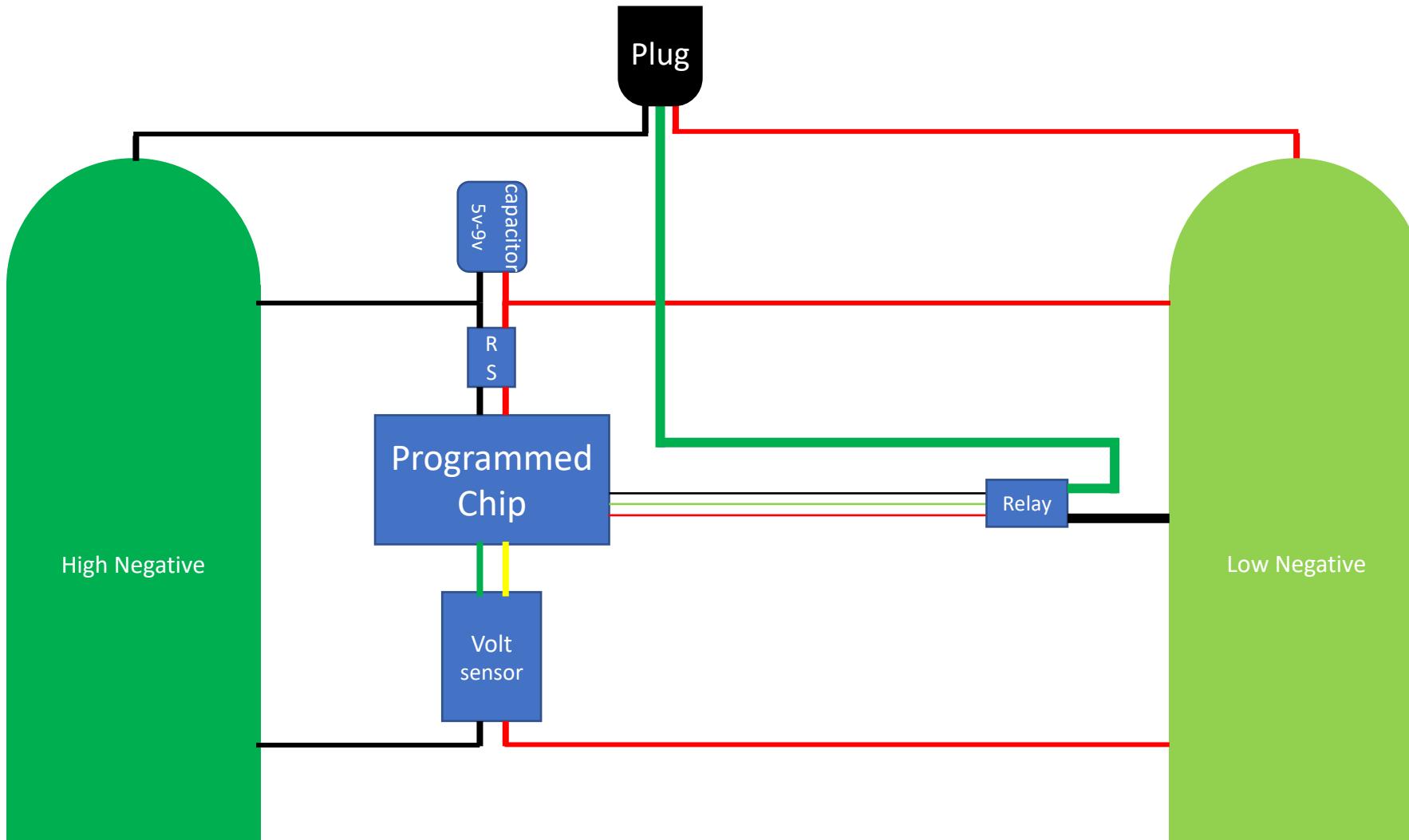
- Working Prototype 2
- Stationary Energy Backup prod
- Dedicated Circuit
- 3D printing light materials

Budget Estimate: 200000 - 800000









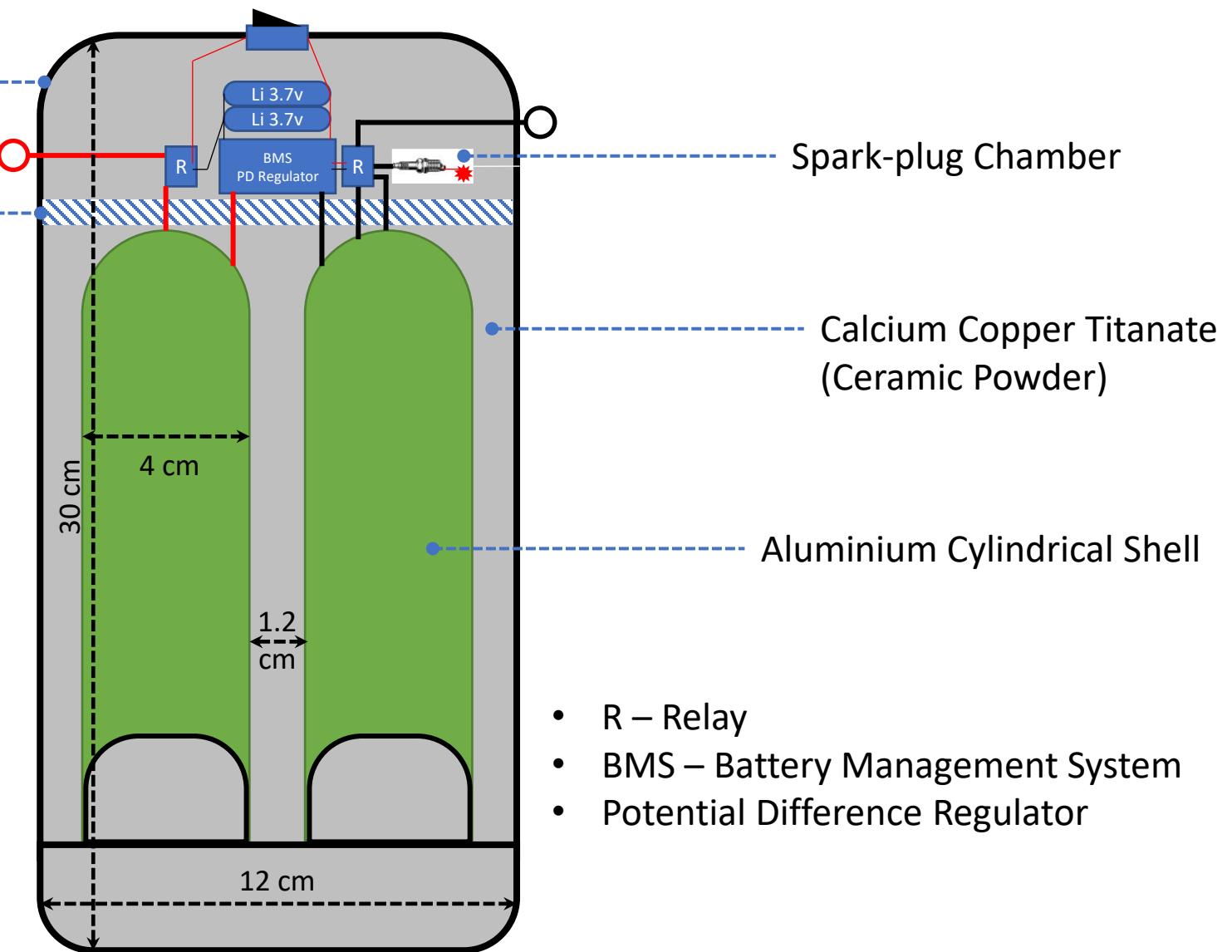
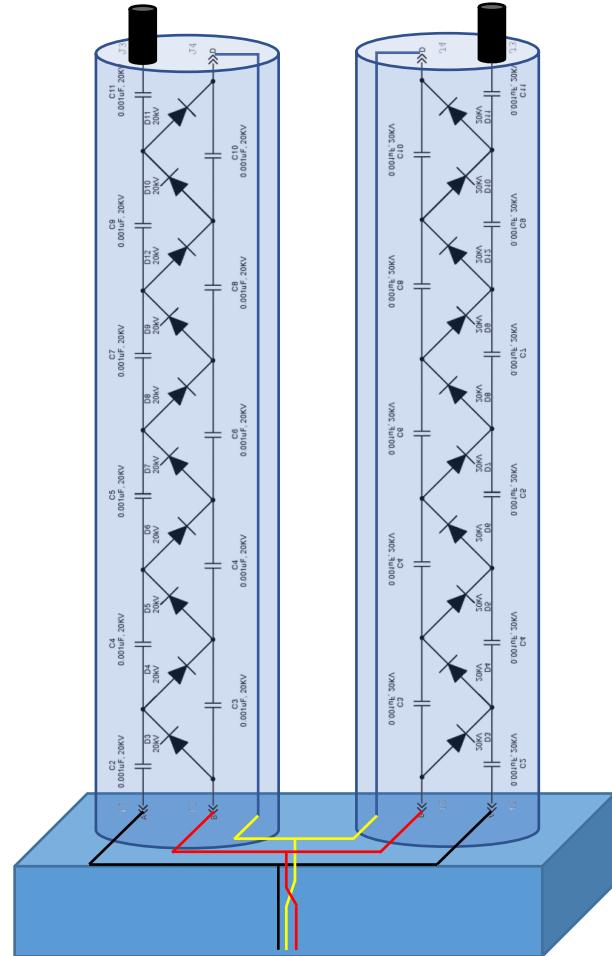
Neoprene Rubber Layer

Teflon Layer

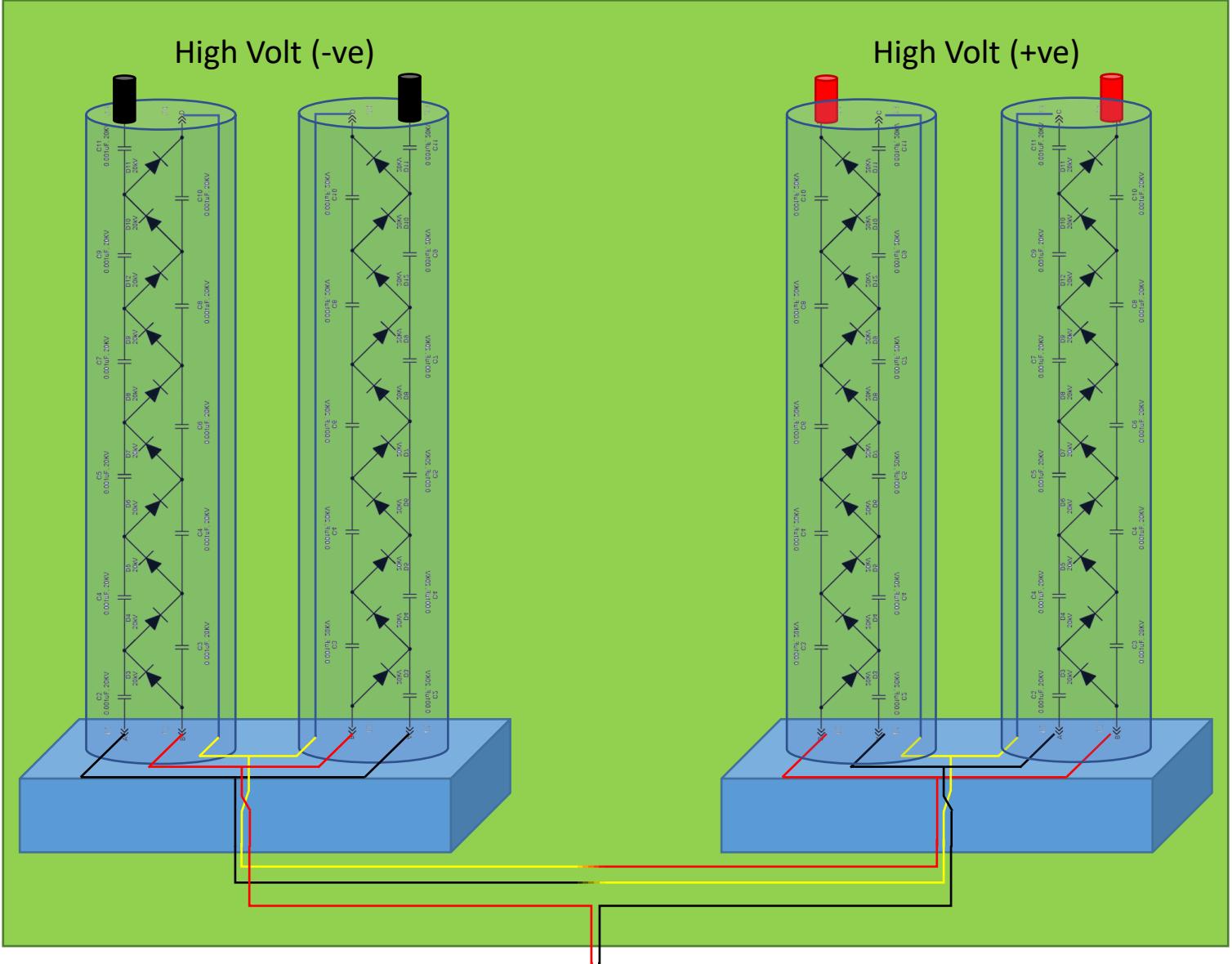
Nylon Layer

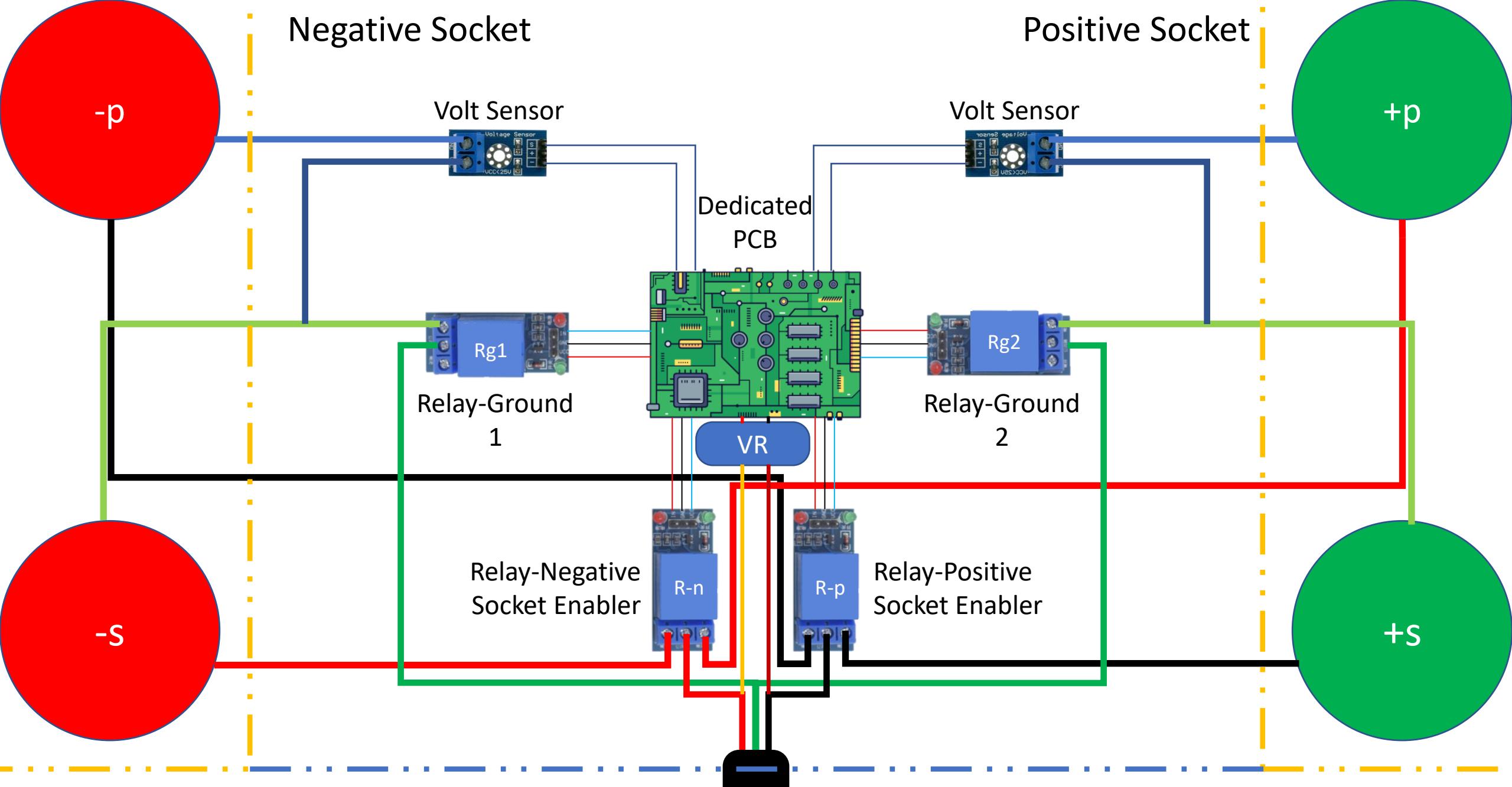
Separation Solid Insulator

High Volt (-ve)



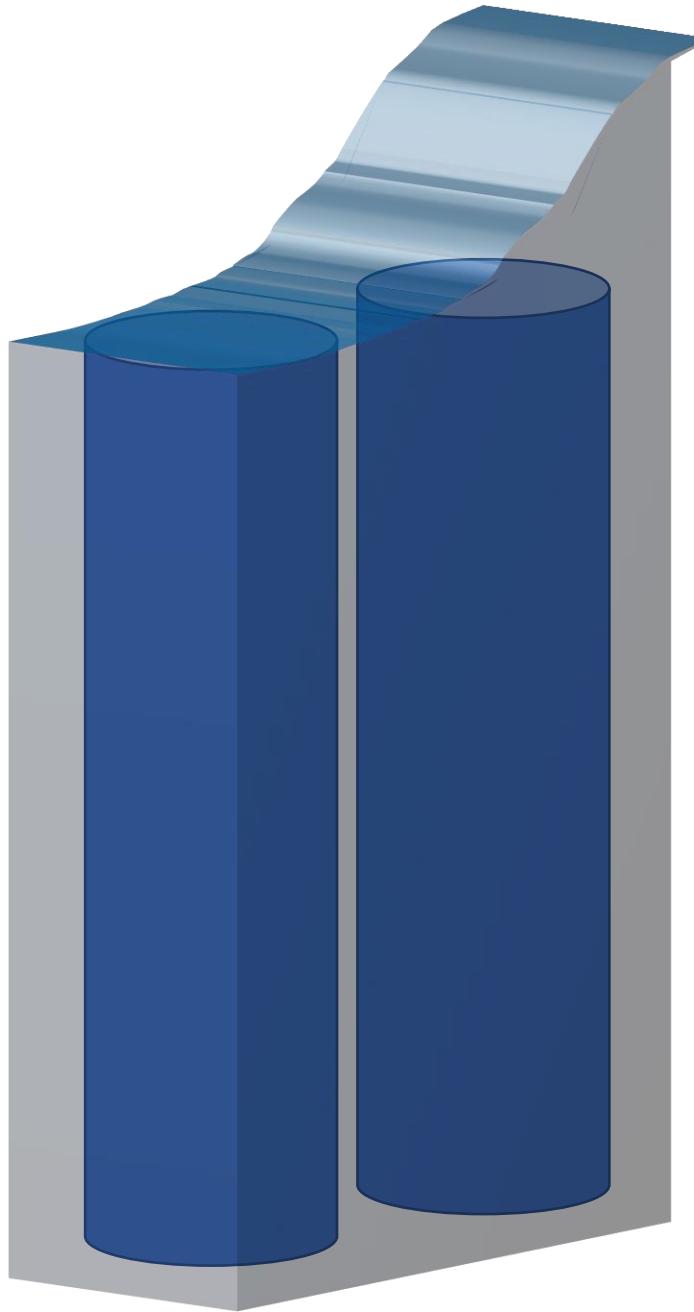
- R – Relay
 - BMS – Battery Management System
 - Potential Difference Regulator

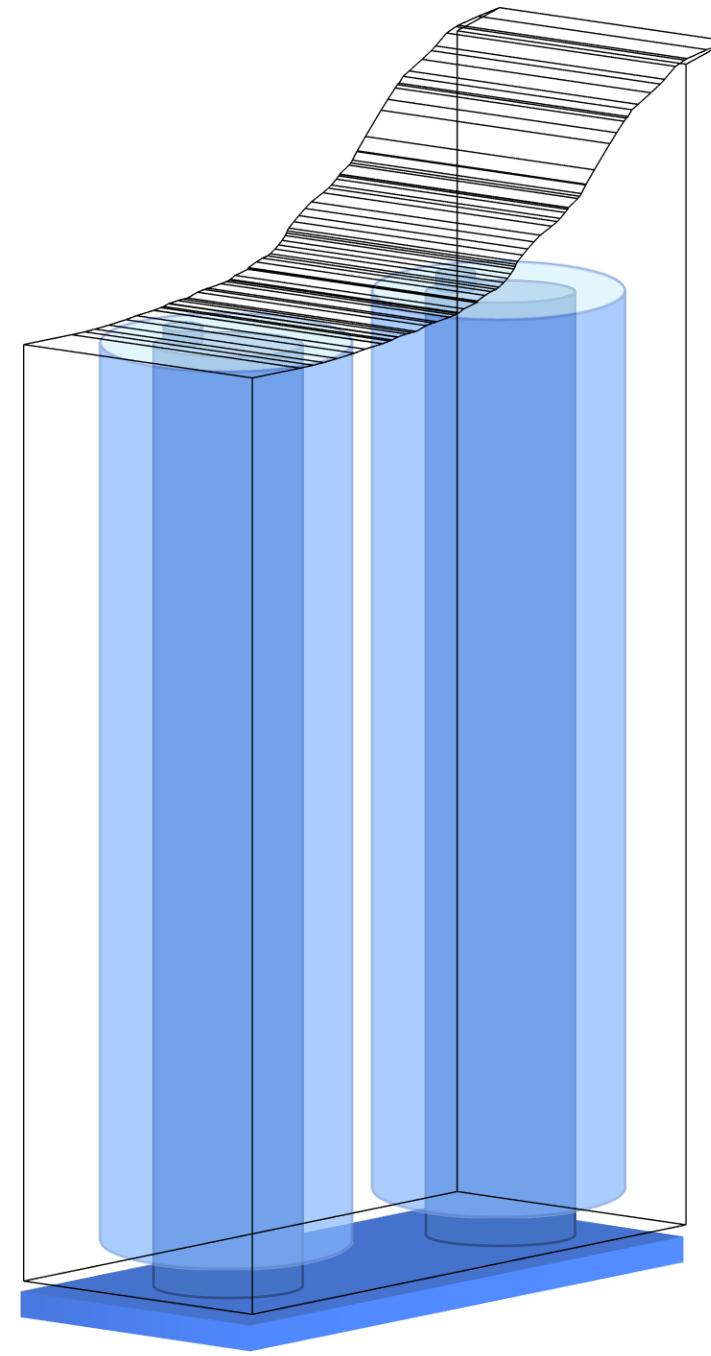






SCS



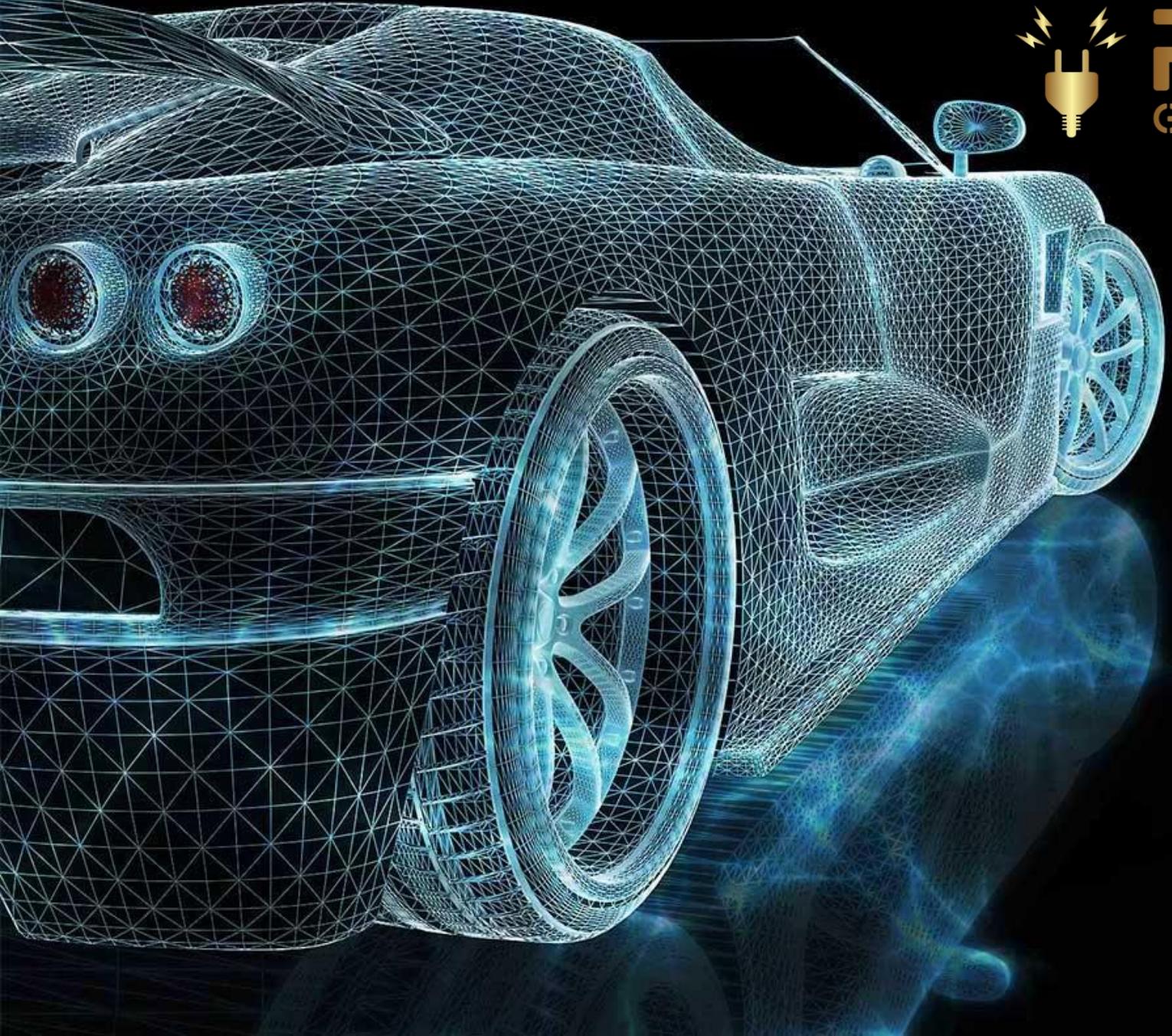


Phase-3:

- Integrated Body System
- Prototype car
- Safety Evaluation
- Many other possible vehicles



Budget Estimate: 15 – 50 Lakh



RYM
GRENERGY Solution Pvt. LTd.



Customer



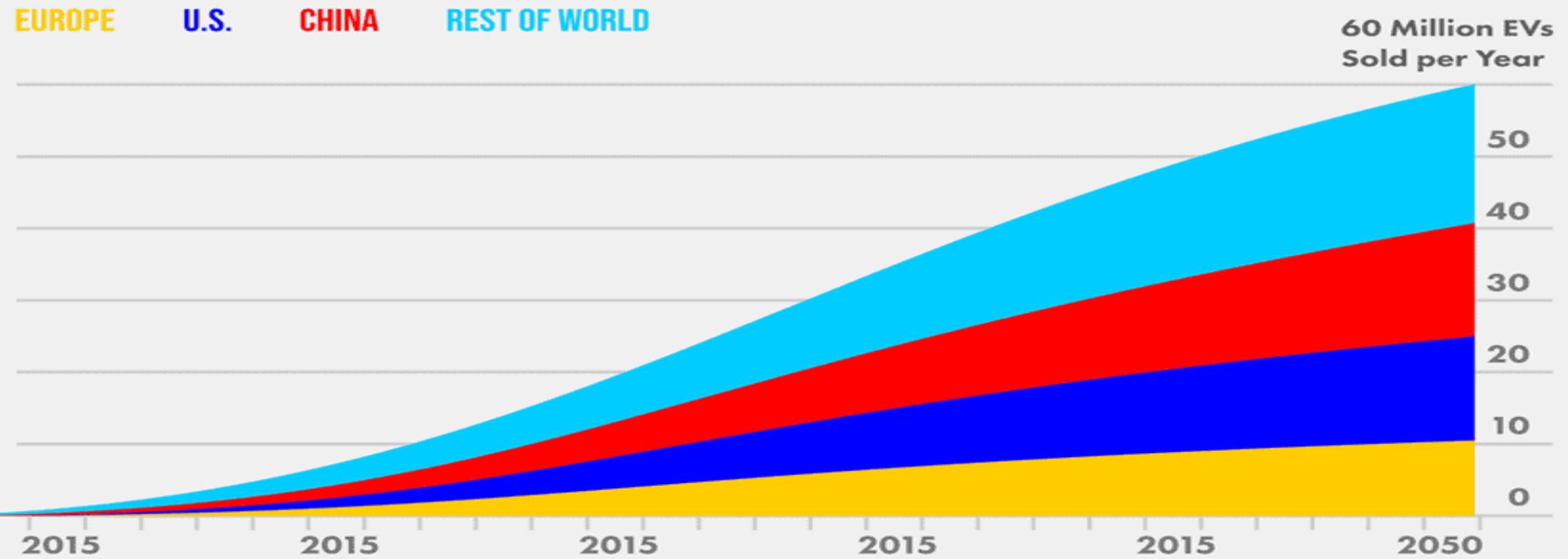
**Primary Buyers: EV
Manufacturers/OEMs**

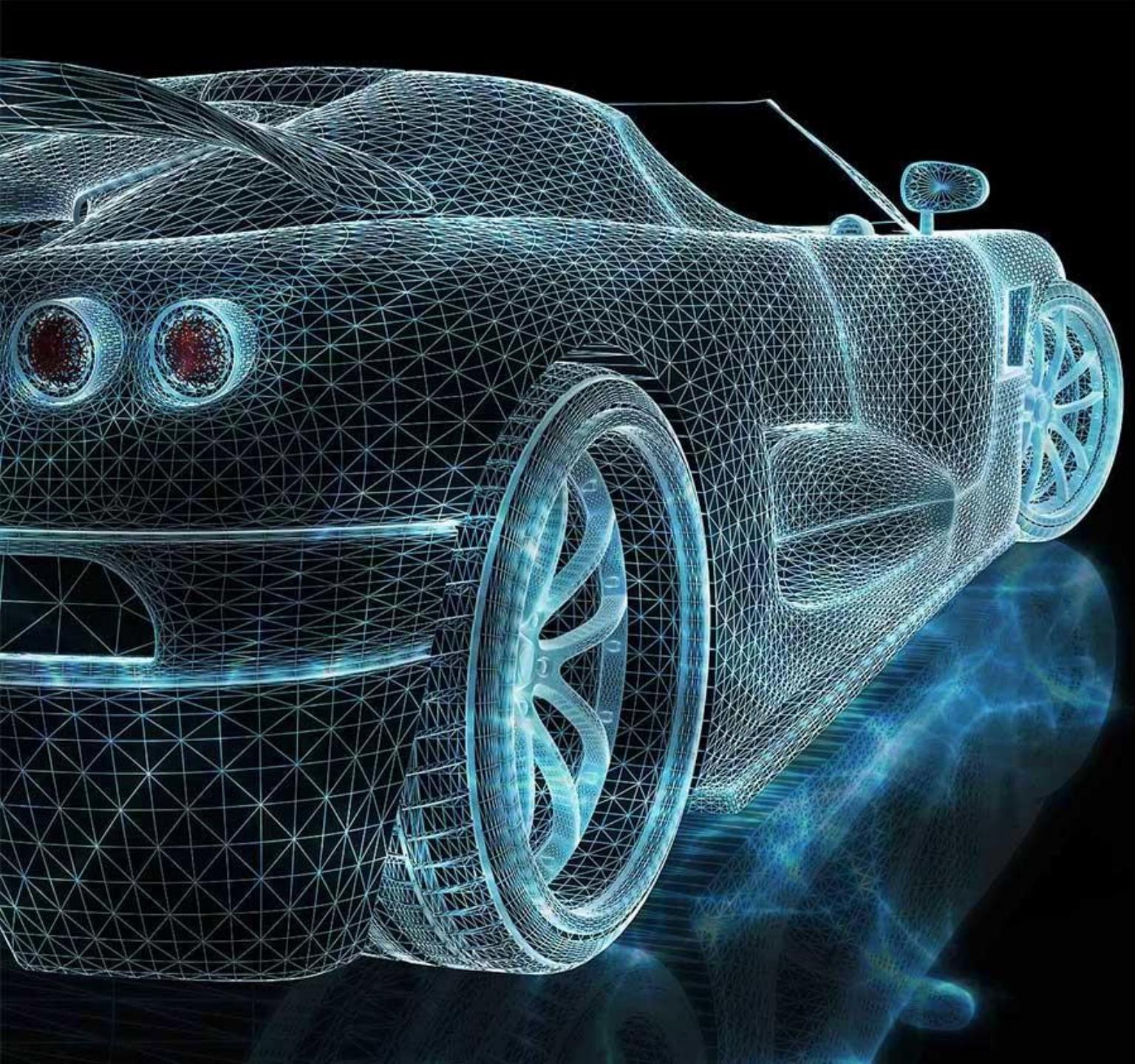


**Primary Customer: EV
Manufacturer/OEMs
B2B**



Projected Sales of Electric Cars Globally





Thank You