Energy and Environmental Engineering CEME 102

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GLOBAL AND NATIONAL ENERGY SCENARIO. (1 hours)

INTRODUCTION TO ENERGY SOURCES (2 hours)

Classification of Energy Sources in terms of Primary and Secondary Sources, Commercial and Non Commercial Sources of Energy; Renewable and Fossil based Sources of Energy;

INTRODUCTION TO FUELS AND ITS PROPERTIES (1 hours)

INTRODUCTION TO VARIOUS ENERGY CONVERSION SYSTEMS (6 hours)

like Power Plant, Pump, Refrigerator, Air Conditioner, Internal Combustion Engine, Solar PV Cell, Solar Water Heating System, Biogas Plant, Wind Turbine System general functioning including their normal rating specifications.
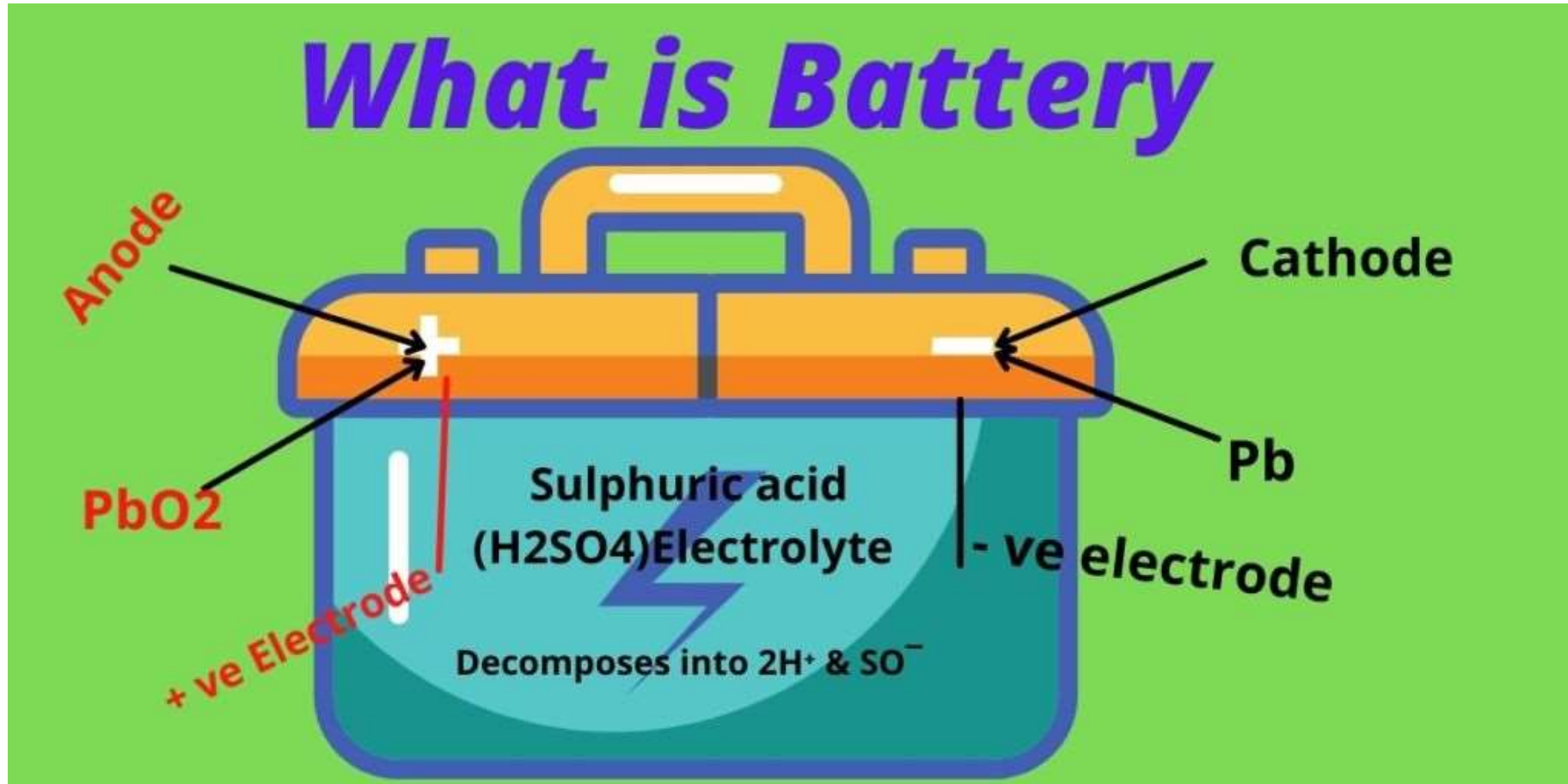
ASPECTS OF ENERGY CONSERVATION AND MANAGEMENT (4 hours)

Energy Conservation Act, Energy Policy of Company; Need for Energy Standards and Labelling; Energy Building Codes.

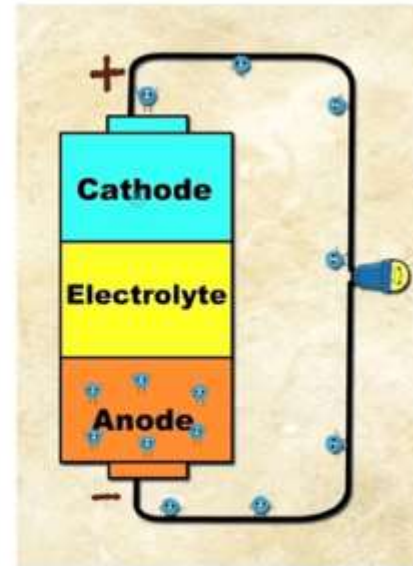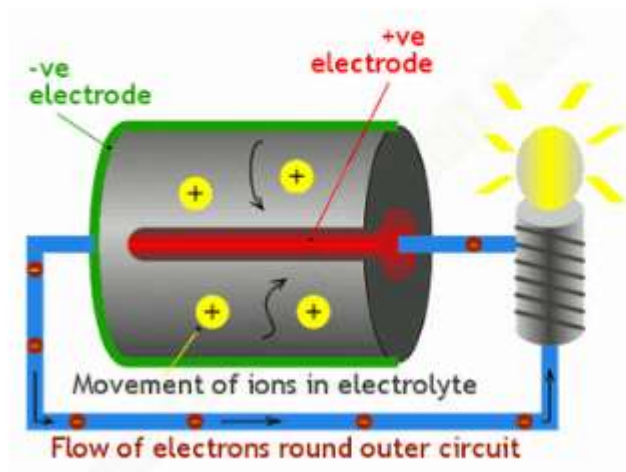## ENERGY STORAGE IN BATTERIES (2 hours)
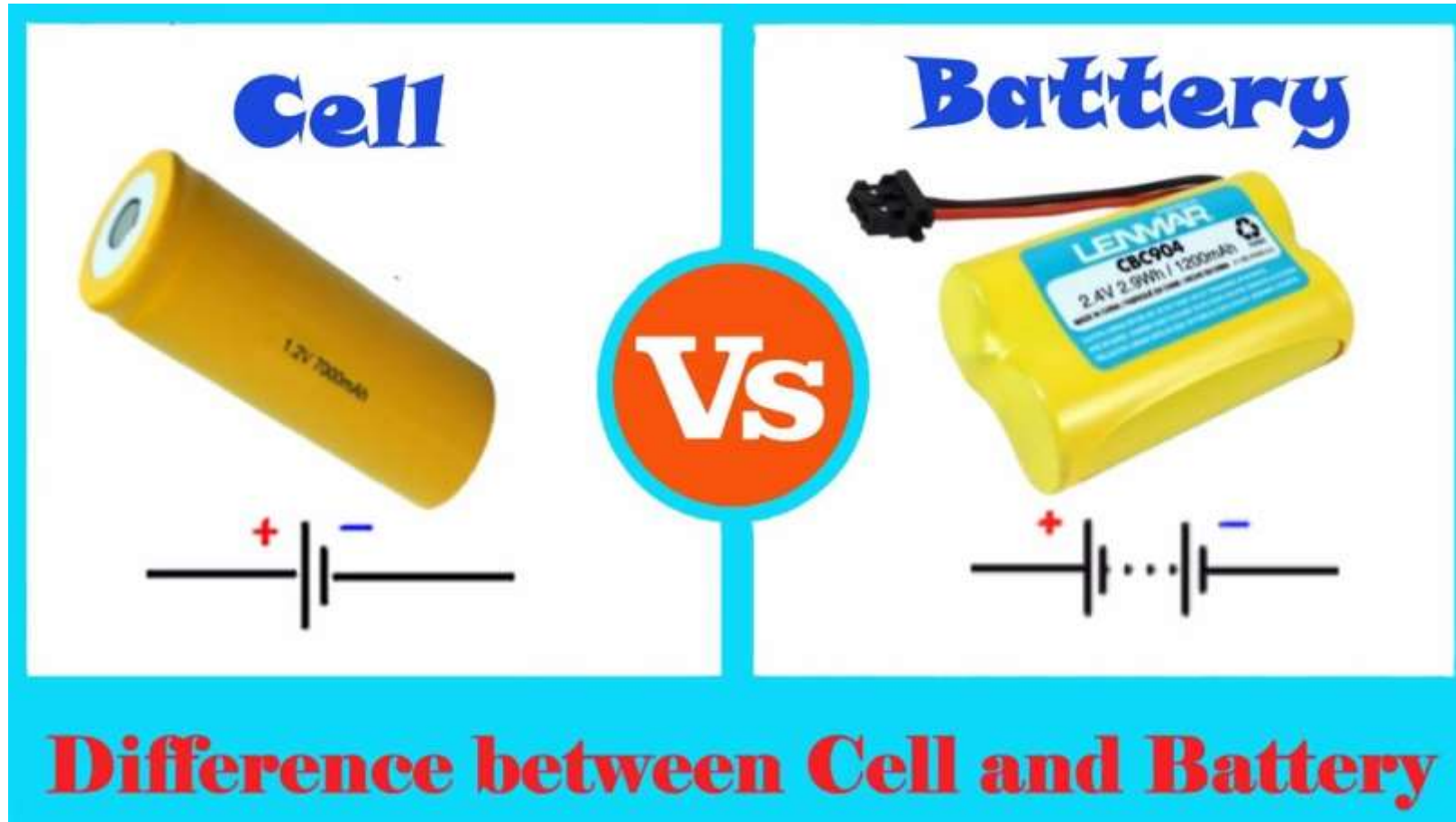
Type of batteries; Electric Vehicles

Battery??

Working of a battery

How Does a Battery Work?

-ve electrode
+ve electrode
Movement of ions in electrolyte
Flow of electrons round outer circuit

Cathode
Electrolyte
Anode

Electrical 4 U

Cell vs Battery

Types of Batteries
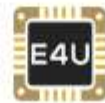
Classification of Batteries

PRIMARY CELLS
**VERSUS**
SECONDARY CELLS

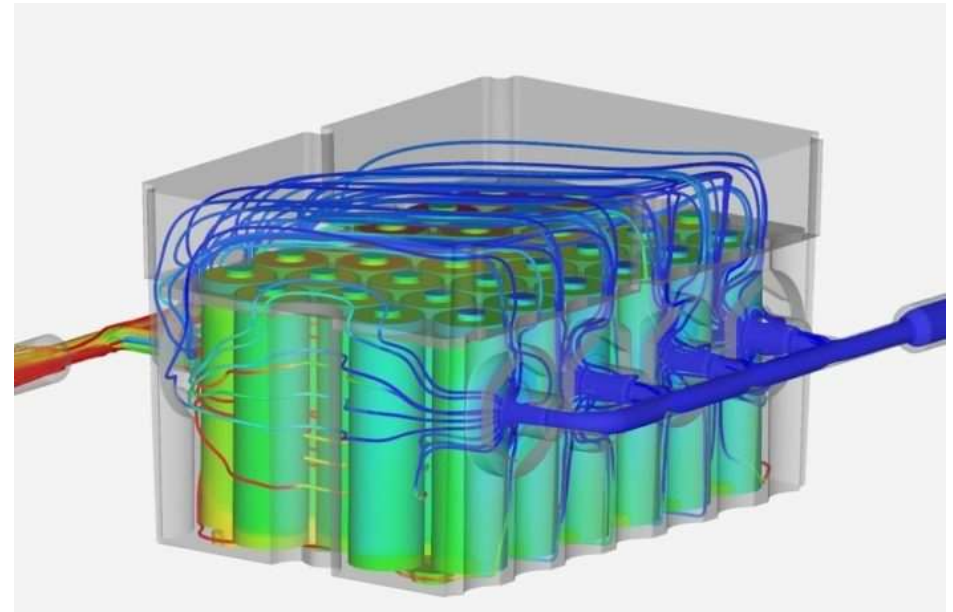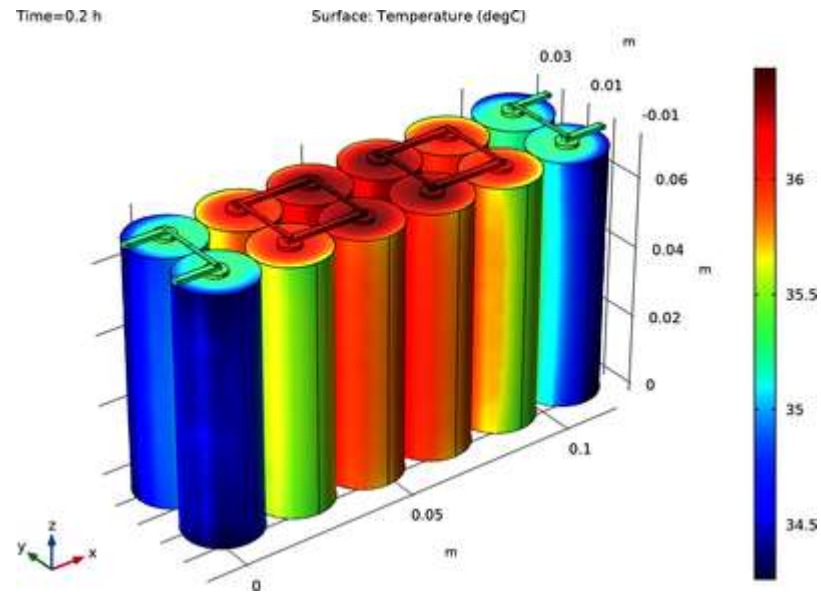| Primary Cells	Secondary Cells
Primary cells are batteries that cannot be recharged or reused	Secondary cells are batteries that can be recharged and reused
Irreversible reactions occur	Reversible reactions occur
Can be used only once	Can be used more than once
Used in portable devices as they produce current immediately	Needs to be charged before use and are used in automobiles
Have lower self-discharge rates and can be used for long term storage of power	Have a higher self-discharge rate compared to primary cells

Lithium–ion Battery

Lead Acid Battery

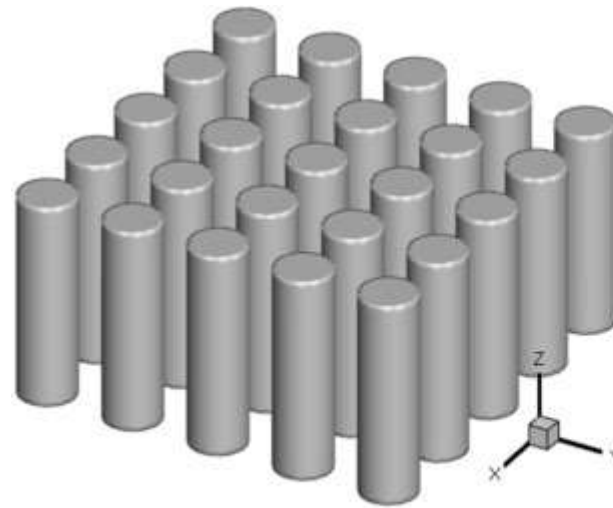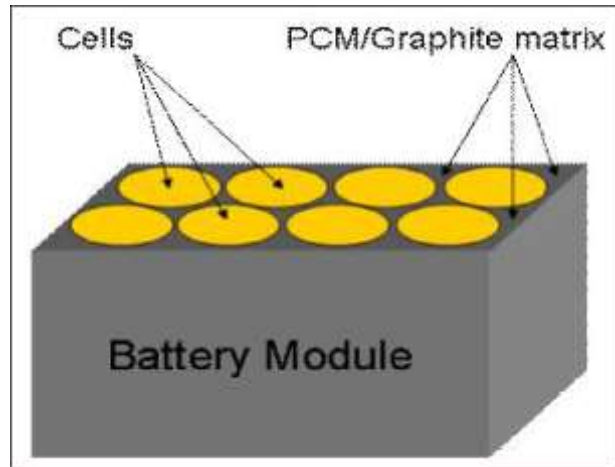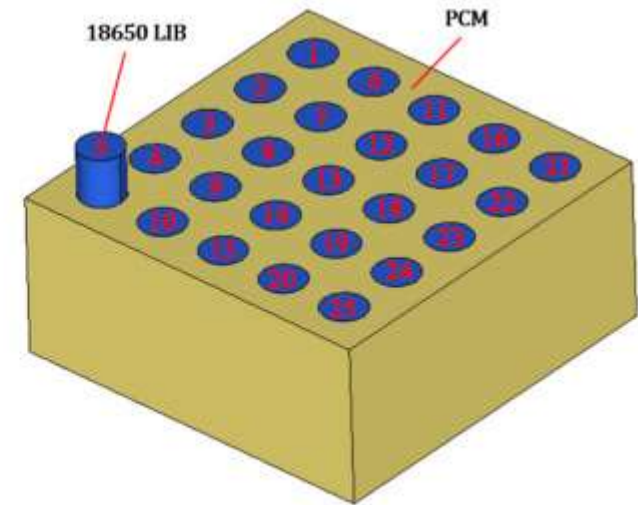The image part with relationship ID rId2 was not found in the file.
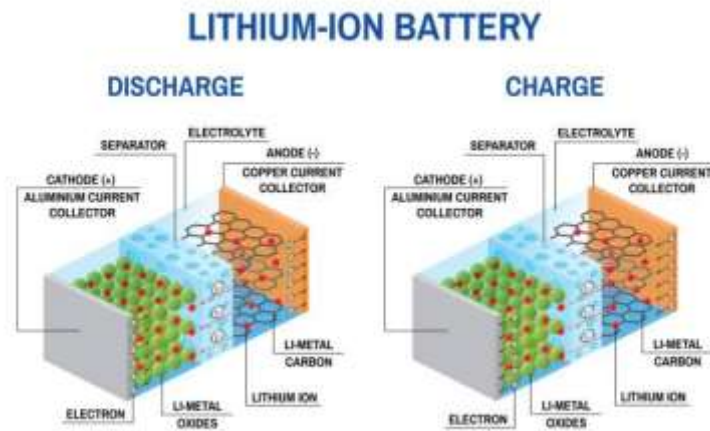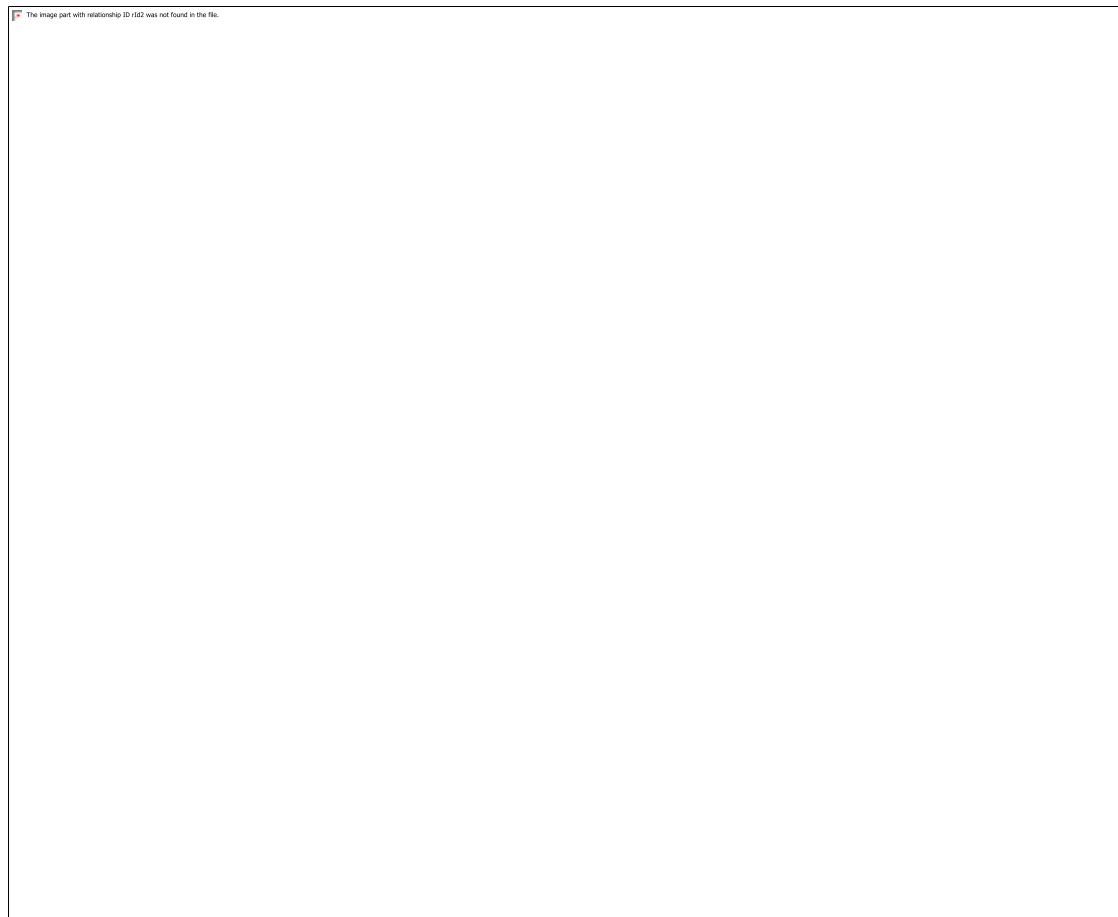
Application of Batteries

Battery thermal management

BTM with PCM

(a)

(b)