Industrial Expert Lecture on "Your Future in Power Electronics: shaping the world through EV, Aerospace and Renewables" in the Dept. Electrical Engineering, NIT Raipur

by

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Venue: S4, EED, NIT Raipur **Dt: 08-08-24**

Key Points:

- Electrification is crucial for addressing climate challenges; adoption of EVs and HEVs is key.
- Growth in EV market to $264.8 billion by 2026 drives energy infrastructure development, including charging and power train technology.
- New EV challenges include decentralization, renewable energy integration, vehicle-to-grid technology, and high-power density converters.
- High-power density converters (SiC and GaN) reduce losses, decrease battery size, and save up to 40% in power.
- Research areas in EVs: fast battery degradation, second-life batteries, and battery management systems.
- Electric aircraft could reduce mechanical system complexity by 50%.
- eVTOLs offer benefits such as less maintenance, silent operation, reduced size and weight, and cost reduction.
- Research in aircraft power systems focuses on advanced architectures, high-voltage systems, and solid-state power controllers.
- Renewable and battery-based micro/nano grids can ensure reliable electricity.
- Global increase in renewable installed capacity.
- Energy storage systems (ESS) are crucial for advancing renewable energy, leading to developments in ESS technology.
- Smart energy storage functionality, including smart inverters, improves grid reliability and reduces outages.