



EV Technology Developments

Formula E and Race to Road

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How is Formula E Contributing?

Technical:

- Street circuits: relevant drive cycles
- Low pollution: emissions and noise
- Cost managed
- Technology development
- Technology test and stress

Commercial:

- New audiences and fan engagement
- Brand and technology awareness
- EV credibility



Evolution of Formula E

Generation 1:

- 2 cars per 45 minute race
- 2 wheel drive
- 200kW power, 150kW regeneration
- Passive brakes

Generation 2:

- 1 car per 45 minute race
- 250kW power and regeneration
- Active rear brakes
- Fast charging

Generation 3:

- Smaller, lighter car, still 45 minute race
- 350kW power, 600kW regen
- Active front brakes, no rear brakes
- Ultra fast charging



Latest Developments: Road & Race

Motor

- Optimising via speed / size
- Magnetic materials and topologies
- Mechanical & electrical loss reduction

Inverter

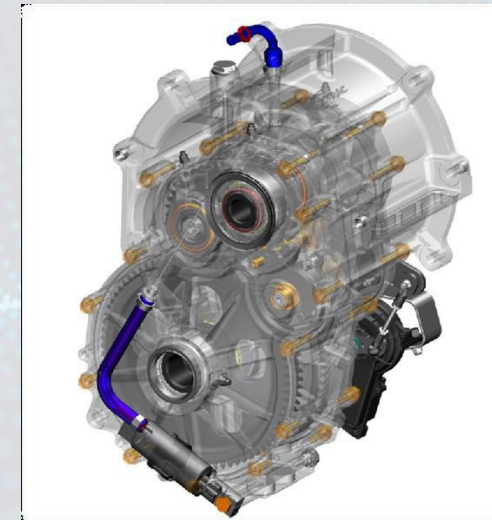
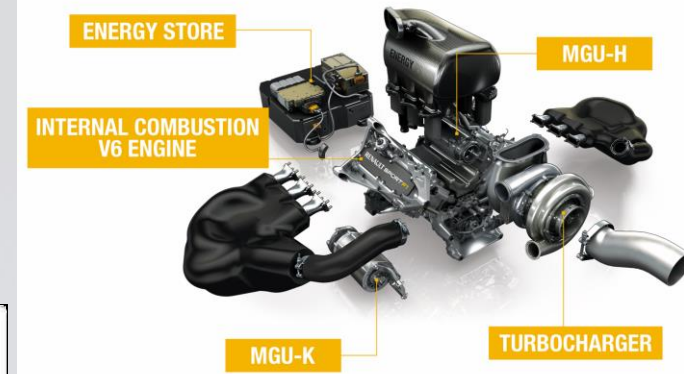
- Silicon Carbide power modules
- Improved cooling and weight
- Control for power and efficiency

Energy Storage

- Cell technology and charge rates
- Cooling systems
- Packaging & safety
- Battery management

Transmissions:

- Simplification
- Lubrication
- Efficiency optimisation



Motorsport EV Technology Transfer

Mahindra:

- “Race to Road”
 - Mahindra and Pininfarina cars
 - High and low performance
 - Direct collaboration between race and road project teams
 - Technology, supplier and knowledge transfer
 - Commercial gains



Rockfort Engineering:

- Design and Consultancy
 - Knowledge & technology transfer
 - Design techniques
 - Supplier network
 - Efficient design methodologies
 - High and low performance applications





Panel Discussion



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