



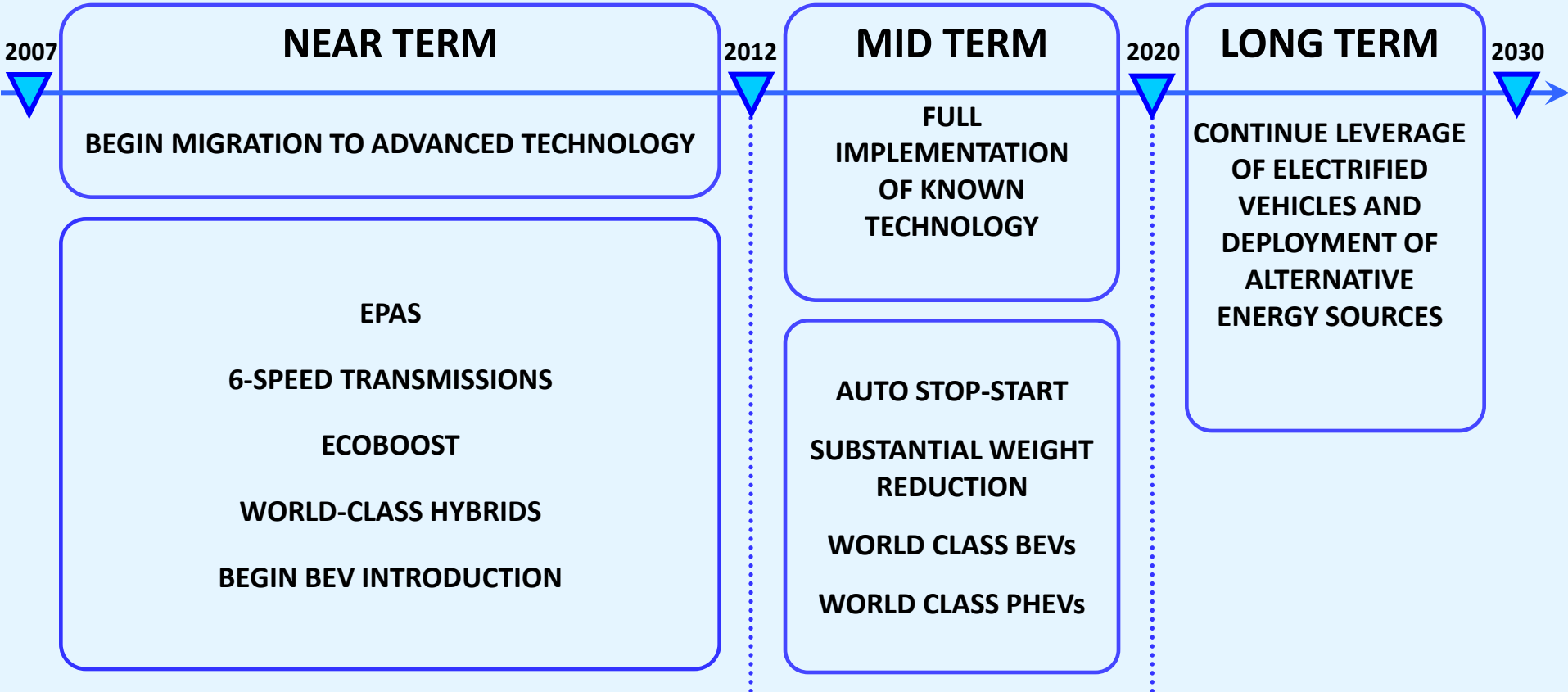
Chuck Gray

Chief Engineer

Sustainable Mobility Technologies Engineering

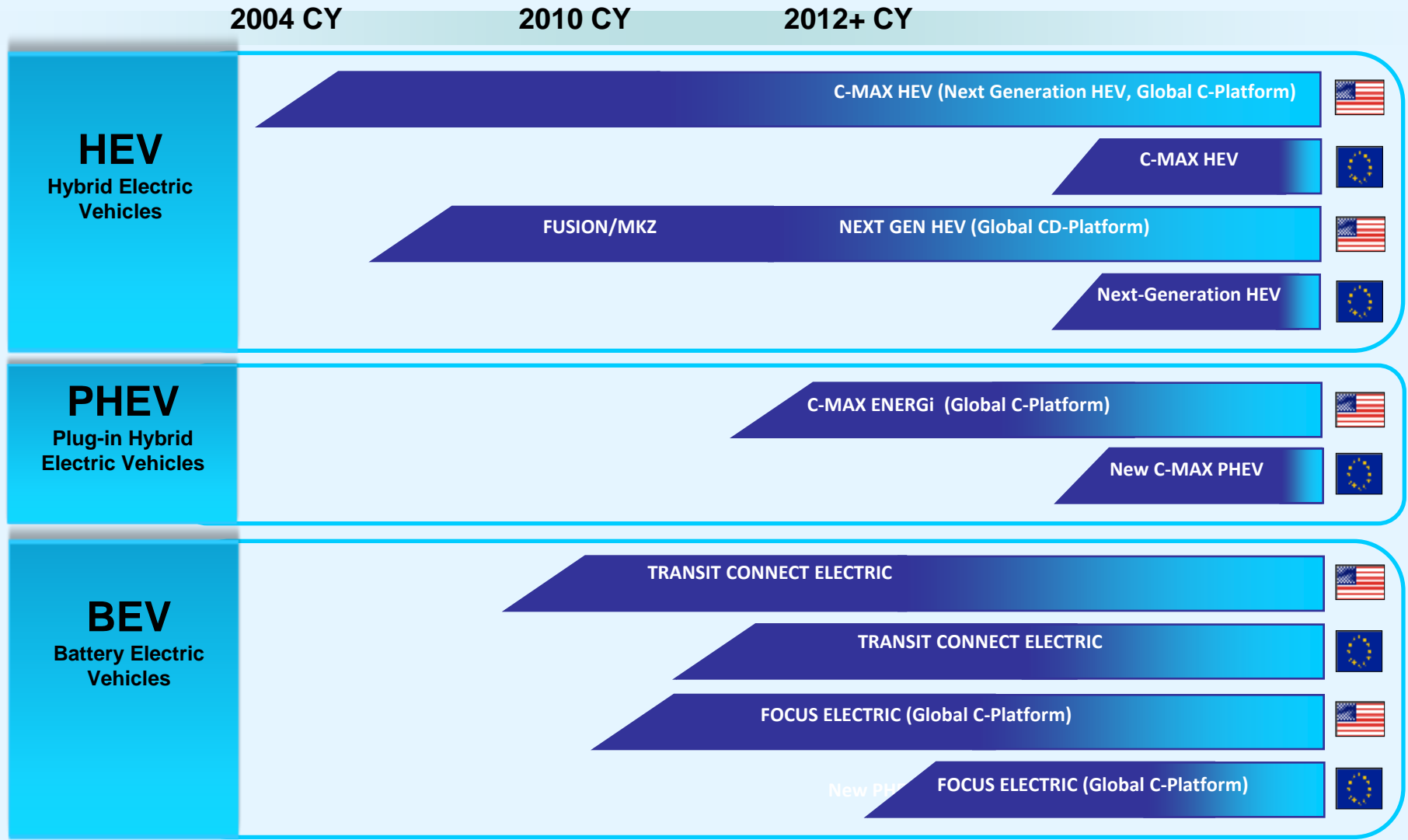
FORD SUSTAINABILITY STRATEGY

TECHNOLOGY MIGRATION



Ford's Sustainability Strategy, Founded On Affordability For Millions Of Customers, Remains In Place As We Move To The Mid-Term.

ELECTRIFICATION PROJECTS – US and Europe



Ford's Industry-unique Approach will Deliver 5 New Electrified Vehicle Alternatives for US Customers by 2012 and for European Customers by 2013.

Ford's "Power Split" Hybrid System

**14 Gasoline Engine
w/ Atkinson Cycle**

Battery

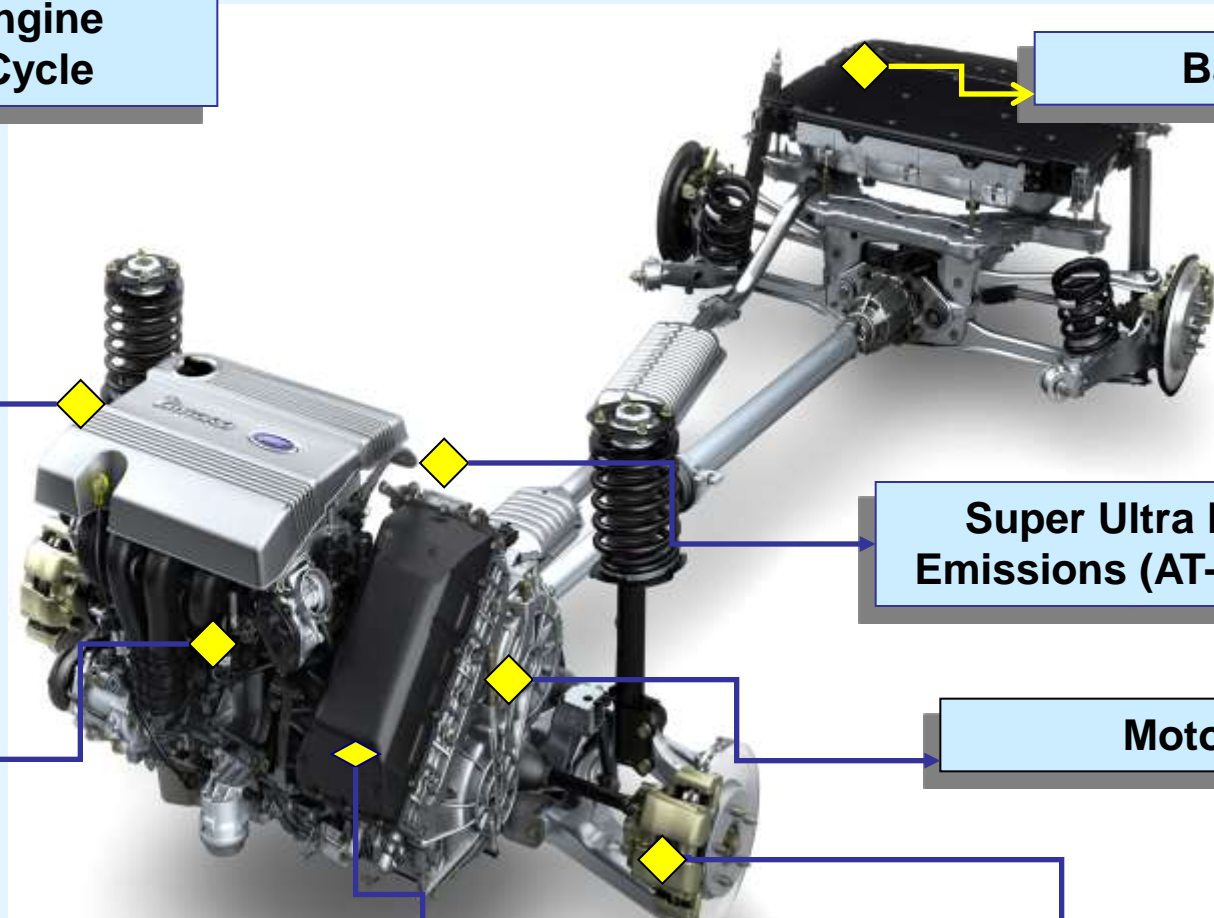
**Super Ultra Low
Emissions (AT-PZEV)**

**Electric
Transaxle**

Motors

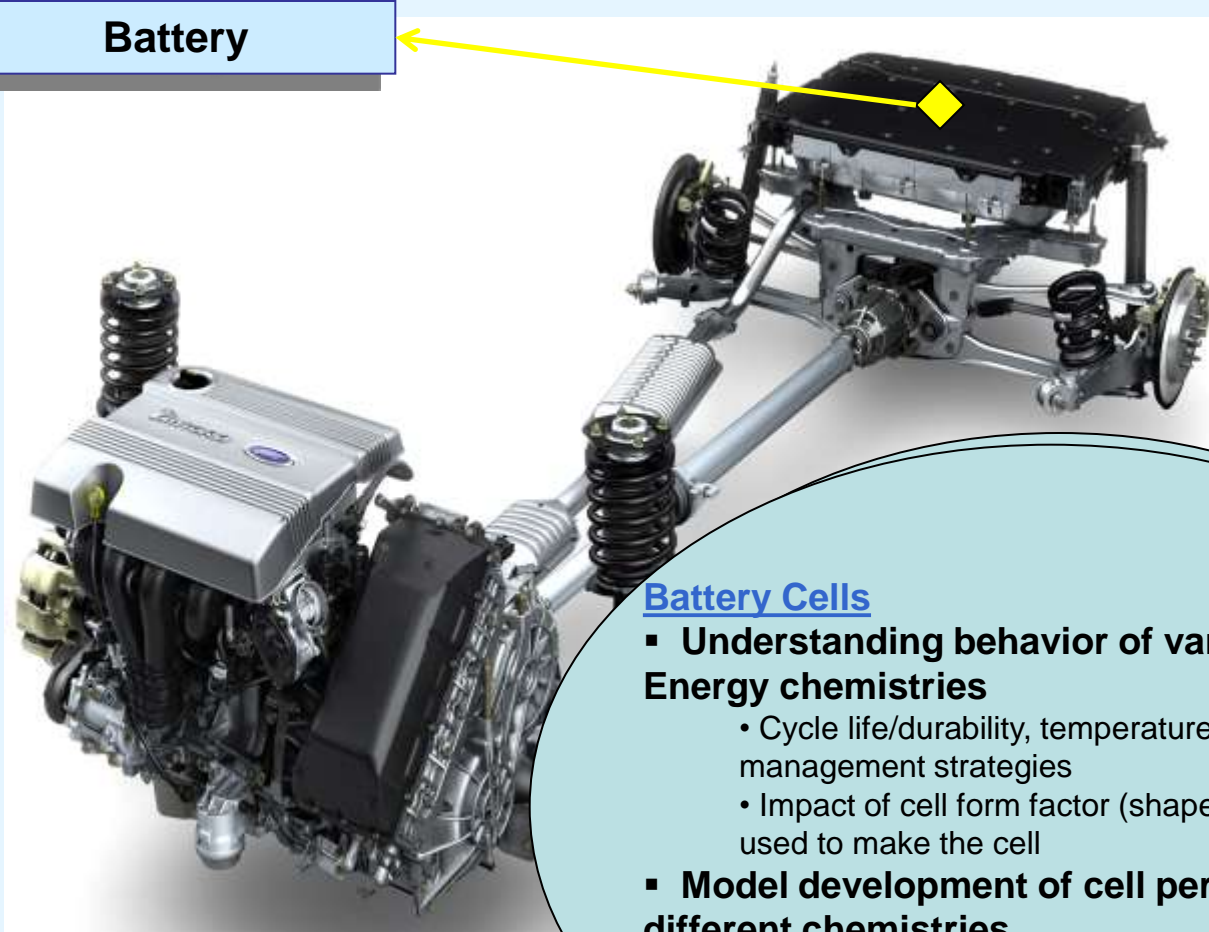
Inverters

**Series Regenerative
Braking**



Ford's "Power Split" Hybrid System

Battery



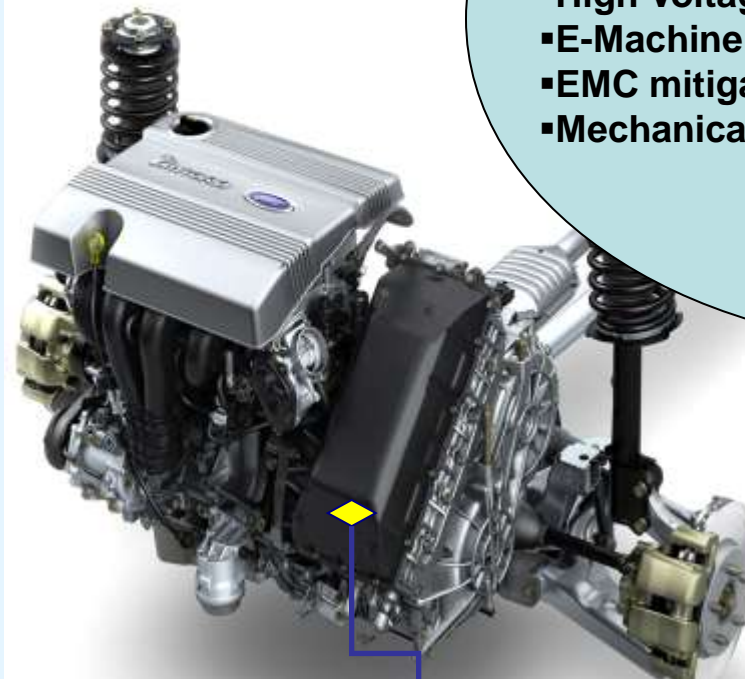
Battery Cells

- **Understanding behavior of various Power and Energy chemistries**
 - Cycle life/durability, temperature effects, and vent gas management strategies
 - Impact of cell form factor (shape) and materials used to make the cell
- **Model development of cell performance using different chemistries**

Ford's "Power Split" Hybrid System

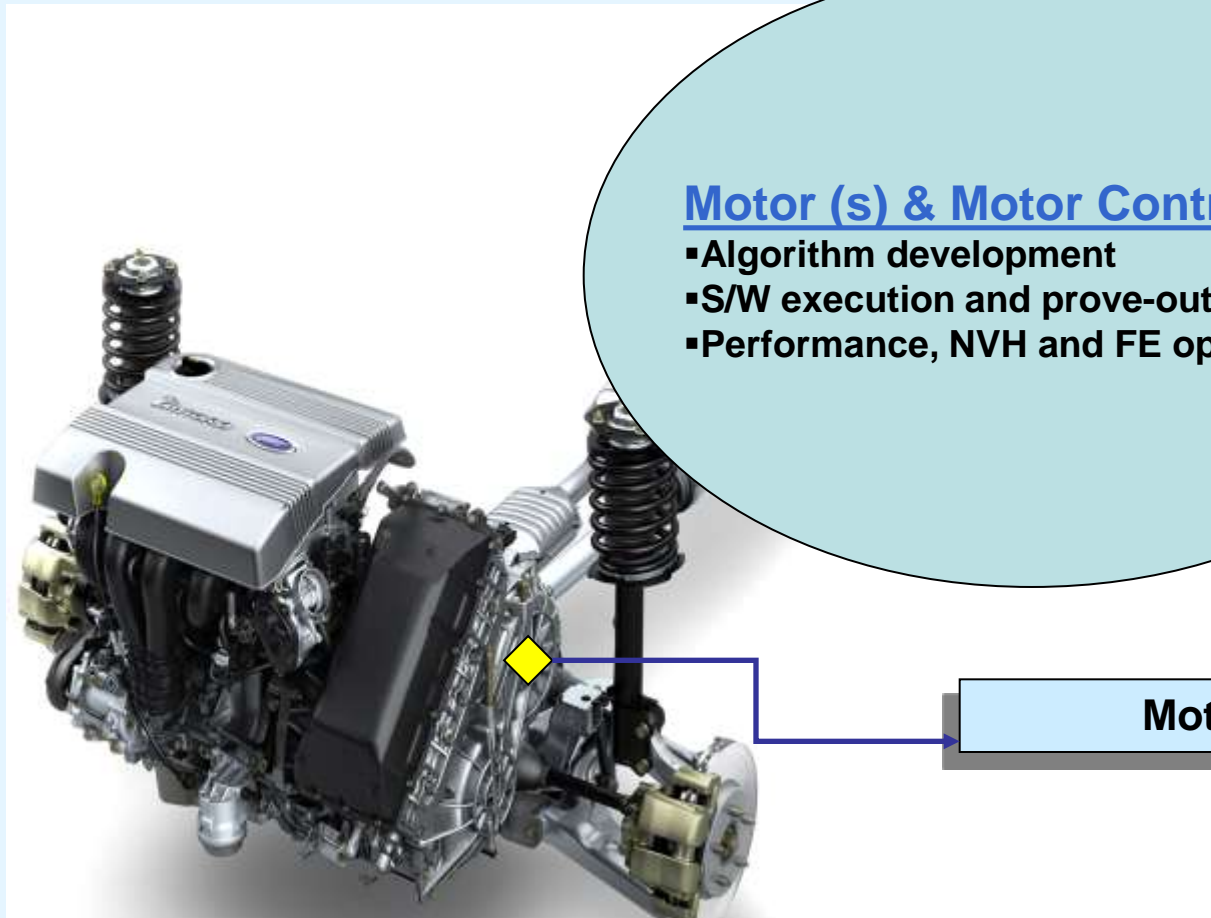
E-Drive System and Power Electronics (Inverters)

- High Voltage Conversion & Control
- E-Machine & Inverter system optimization
- EMC mitigation
- Mechanical design for thermal & robustness



Inverters

Ford's "Power Split" Hybrid System



Motor (s) & Motor Controls

- Algorithm development
- S/W execution and prove-out
- Performance, NVH and FE optimization

Motors

MAGMA & Ford

- **Ford continues to be a strong supporter and partner with MAGMA**
- **Ford has shared its list of key skills and competencies for electrification with MAGMA and its educational institution partners to guide the development of world-class engineering courses.**
- **Through MAGMA, Ford engineering workforce has benefitted from these unique and valuable training programs**
 - 200+ taken/enrolled in MAGMA sponsored graduate engineering courses at UD Mercy, MTU and WSU
 - 2000+ taken/enrolled electrification short courses from UD Mercy, WSU
- **As Ford continues to grow its electrification workforce, these MAGMA-sponsored education programs will be a key source of “home grown” talent for new jobs**

Ford Electrification Opportunities

At Ford Motor Company, we are dedicated to designing, manufacturing and selling high quality vehicles that meet the diverse needs of our customers. We believe our employees and the different perspectives that they bring to the business are the driving force behind our success. Come discover a company that is focused on the quality of our vehicles, the environment, the community and the world in which we live. By choice, we are an Equal Opportunity Employer committed to a culturally diverse workforce.

As we continue to perfect our Electrification Technologies and grow our electrified vehicle portfolio, we are currently looking for highly qualified and motivated engineers to join the Ford Team. Our current open positions are listed below. Please go to www.careers.ford.com to view the opportunities and apply online.

- Battery System Research Engineer
- Battery Controls Research Engineer
- Battery Controls Engineer
- Battery Systems CAE Engineer
- Battery Applications Engineer
- Battery Safety Engineer
- Battery Characterization/Degradation Engineer
- Cell & Materials Degradation Analysis Engineer
- Electric Machine Engineer
- Electric Machine Research Engineer
- Electric Machine Drive Controls Engineer
- Energy Storage Research Engineer
- Hardware-in-the-Loop Engineer
- HEV/PHEV/BEV Calibration Engineer
- HEV/PHEV/BEV Controls Engineer
- HEV/PHEV/BEV Systems Engineer
- High Energy Cell Development Engineer
- Power Electronics Engineer
- Power Electronics Research Engineer
- Vehicle Controls Research Engineer