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Piyush Desai is a hands-on technology leader with three success stories in starting, scaling, and commercializing new technology businesses. He received his M.S. and Ph.D. from the Illinois Institute of Technology, where he also served as an adjunct faculty for teaching Motors and Drives classes to EE undergraduates and graduates. His research focuses on high-performance electric machine designs (switched reluctance, permanent magnet, and induction), control algorithm development, and simulation-driven virtual prototyping. He holds several granted and pending patents worldwide. In his 29 years career in the field of aerospace & defense, PV solar, and industrial technologies, Piyush worked for multiple companies, founded his own consulting business, and is the original inventor of Turntide's patented High Rotor pole Switched Reluctance Motor (HR-SRM) technology.

Switched Reluctance Motor (SRM) Technology: Value Proposition for Vehicular Applications

The transport sector accounts for 24% of global greenhouse gas emissions equaling 7.3 billion metric tons of carbon dioxide (CO₂) emissions annually. Over 90% of the fuel used for transportation is petroleum based, primarily gasoline and diesel and internal combustion engines have proven to be inefficient wasting more than 65% the heat energy they produce. With the world in a race to electrify all types of vehicles, new technologies are emerging at a head-spinning pace.

One technology on the rise is the switched reluctance motor (SRM). While SRMs are making inroads in the built environment with HVAC upgrades, there is a strong case to be made for vehicular applications. This presentation will explore top characteristics of SRMs that make it ideal for use in vehicles such as torque density, power and efficiency performance, and materials cost. Additional factors that will be explored include how the extended constant power range is optimal for traction drivetrains, the benefits of the SRM winding arrangement, and how SRMs stack up against IPM designs and win.