

**Abstract:** Energy sustainability is arguably one of the most critical challenges for a sustainable future. With predictions showing future scarcity and/or higher degree of extraction difficulty of traditional sources of energy for example coal, oil and natural gas, the shift to sustainable clean sources of energy is a must. Another key reason is the increasing detrimental impact of using fossil fuels. Over the last few decades, there has been serious effort to replace mechanical and hydraulic systems with electrical systems. This effort also includes replacing fixed-speed and old electrical drives with higher performance variable-speed drives. This is mainly due to the higher reliability, efficiency and robustness of electrical systems. This trend of “more electric” systems could be seen across a wide range of applications. These include traction, aerospace, actuation, mining, oil & gas, and industrial applications as examples. This push for electrification posed a lot of challenges to develop electrical systems that meet the demanding requirements of the various applications including harsh environments, high power density, high efficiency and fault tolerance in safety-critical applications. At the heart of the electrification effort is the development of advanced electrical machines and drives. This presentation will provide an overview of the various applications where electrification is taking place. The presentation will focus on electrical machines and drives that have been developed or are currently under development. The presentation will also cover some general trends in electrical machines and potential areas of research.