**Presentation title: Global developments in metal – air batteries for various applications including flying cars**

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**Abstract:**

**Fast developing EV fleets and global warming are hastening the development of alternatives to Lithium ion batteries (LIBs) with their inherent safety and energy limitation concerns. Rechargeable Metal – air batteries (MABs) can be said to work on water and air. They are having high energy density, safety, low cost, sustainable and recyclable properties. Among various alternatives to LIBs studied rechargeable MABs and solid state metal air batteries (SSMABs) are widely considered as suitable for next generation batteries for various energy applications. MABs and SSMABs are also expected to play a key role as suitable energy storage systems for achieving net zero by 2050 as per IEA targets. Several inherent challenges associated with the functioning of MABs and SSMABs have to be overcome before accepting for commercial production. Al -air and Li - air batteries are comparable to jet fuel in energy density making them suitable for various energy storage applications including large-scale energy storage systems to electric vehicles and portable devices, flying cars, electric aircrafts, heavy trucks. The overview, global developments and breakthroughs in Al-air, Zn -air and Li-air are briefly presented. The latest developments in SSMABs are summarized with focus on solid state Li –air batteries (SSLABs). Effective strategies, key issues, future directions for developing high performing SSMABs and SSLABs are discussed. The progress made and the expectations of Metal –air flow batteries and the projects in pipe line are presented. World wide projects in flying cars, domestic electric aircrafts involving MABs and developments in MABs startups and manufacturing companies are also briefed. The expected time lines for the commercial availability of MABs and SSMABs in the market are indicated. Finally the future expected cost and global market value of MABs have been presented.**

**Biography of Dr. Parvatam Siva Prasad:**

**Siva was awarded PhD degree in Chemistry from IITM, India in 1979 specializing in Electrochemistry . Having over 45 years of global chemical industrial research experience. Worked in a span of industries including petrochemical, polymer coatings including specialty UV curable coatings, polymer recycling, chemical recycling, Geopolymer concrete, specialty chemical formulations. Having several proven technologies to credit supported by several international publications, patents, and presentations in conferences. Gave several invited lectures in national and international conferences as key note speaker. Working on EV battery development and recycling for the last six years and currently focusing on development of solid state metal – air EV batteries for applications in domestic electric aircrafts, heavy trucks, flying cars, and all other consumer energy needs in view of their 100% recyclability, safety, sustainability, low cost and environment friendly materials. Presently working as Independent Senior Chemical Consultant to various process industries, eco friendly and EV battery industries in India and based at Chennai**