PRESS RELEASE

India Energy Storage Summit 2019 explores creation of a safe, secure and sustainable energy storage ecosystem for India

Industry, Academia and the Government need to work together on Battery storage technology, standards and policy so as to find affordable solutions for India: Prof. Ashok Jhunjhunwala

CHENNAI, 15th October 2019: The India Energy Storage Summit (IESS) 2019, a two-day interactive summit, was organized by Underwriters Laboratories, the not-for-profit organization within UL, in partnership with Centre for Battery Engineering and Electric Vehicles (C-BEEV), IIT Madras, and with the support of GE Global Research and the Automotive Research Association of India (ARAI) on 23rd and 24thSeptember 2019, at the IIT Madras Research Park in Chennai.

India's sustainable energy storage ecosystem is growing at a fast pace. But in order for renewable energy sources such as solar and wind to contribute to a significantly higher proportion of the country's energy demands, energy storage needs to become more affordable and more robust.

Similarly, energy storage in the form of batteries is a critical component of the fast-growing e-mobility ecosystem. With these in mind, IESS 2019 discussed avenues for energy storage to catalyze the growth of electric mobility and renewable energy through emphasis on battery performance, safety and innovation.

Speaking at the event, Terrence Brady, president of Underwriters Laboratories said, "With energy storage devices such as batteries becoming a key part of our everyday lives, whether they are on land or water, or in the air, battery safety and performance has become a critical concern the world over. Summits, such as IESS, that blend cross-functional expertise will prove critical in solving key challenges that energy storage applications face today."

Participating in the event were an array of experts from many relevant fields — electric vehicle (EV) original equipment manufacturers, battery manufacturers, EV charging and battery swapping solution providers, expert academic researchers, renewable energy sector experts, organizations involved in safety and quality standards.

More than 20 experts shared their knowledge during the conference sessions and focused breakout sessions – these included experts from Underwriters Laboratories, IIT-Madras, India Smart Grid Forum (ISGF), Ashok Leyland, SUN Mobility, Mahindra Electric,

Attero Recycling, GE, ARAI and more. The event saw participation by more than 100 delegates from many leading Indian firms and organizations.

Dr. Judy Jeevarajan, director of electrochemical safety for Underwriters Laboratories said, "The main objective of this event was to initiatea collaboration among the key stakeholders in energy storage. With the useful deliberations and interactions that took place over two days, the next logical step is to convene focused groups of experts to start moving the needle on the key takeaways from this event."

Prof. Ashok Jhunjhunwala, Institute Professor, IITMadras, said, "Storage plays a key role not only in growth of electric vehicles, but also for the growth of renewable energy. Industry, academia and the government need to work together on storage technology, standards and policy so as to find affordable solutions for India. The event was an important step in this direction."

The key takeaways of the summit are:

- Li-ion batteries designed and customised for Indian conditions and constraints could help to accelerate EV adoption in India
- Battery swapping, if done effectively, can significantly mitigate the key concerns of EV users such as range anxiety, charging time and battery costs
- Li-ion battery recycling technology is available and working right now in India, and if used effectively, can significantly increase the raw material security for Li-ion batteries made in India in the future
- Li-ion batteries present diverse hazards under different environments; testing mechanisms hence need to evolve as we learn more about these risks
- With the cost of Li-ion batteries decreasing rapidly, battery systems for captive energy use to address a large portion of the end user's energy needs is viable today
- Government, industry and academia need to work together on different aspects of energy storage for the development of technology, standards, policy
- Battery safety research in collaboration with key stakeholders will provide a path forward in generating awareness, skill development and outreach initiatives

Based on the key takeaways, Underwriters Laboratories will evolve a platform to enhance energy storage solutions that facilitates robust growth of India's sustainable energy and e-mobility ecosystems.

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About UL

UL helps create a better world by applying science to solve safety, security and sustainability challenges. We empower trust by enabling the safe adoption of

innovative new products and technologies. Everyone at UL shares a passion to make the world a safer place. All of our work, from independent research and standards development, to testing and certification, to providing analytical and digital solutions, helps improve global well-being. Businesses, industries, governments, regulatory authorities and the public put their trust in us so they can make smarter decisions. To learn more about our nonprofit work, visit www.UL.org.

About C-BEEV

The Centre for Battery Engineering and Electric Vehicles, sponsored by the Department of Heavy Industry and supported by several companies from the automotive and battery industries, is powering electric mobility and energy storage in India through technology, innovation, collaboration and Start-ups. Our primary focus is to make Electric Vehicles affordable in India and support building an ecosystem for EV adoption. The Centre, along with its incubated start-ups, develop cutting-edge technologies for design and commercialization of EV Subsystems including Lithium Ion Battery Packs for fixed and swappable applications across two, three, and four wheelers; associated charging and management systems; micro-mobility; high efficiency electric motors; controllers and vehicle design. Electric three-wheelers and two-wheelers from various manufacturers have been undergoing trials for about 2 years within the IIT Madras Campus and over 250 Million data points have been captured – improving efficiency, optimization and enabling predictive analytics. The Centre is at the forefront of the national efforts to establish lithium ion cell manufacturing, recycling end-of-life lithium ion battery packs and effluent free recovery of raw materials. It also plays a key role in developing standards and policies for faster adoption and manufacture of electric vehicles in India. Additional focus areas for the Centre include Grid Storage and off grid Solar DC applications.

Technology developed by the Centre along with Start-ups have been licensed to partners – leading automotive manufacturers, for commercialization. The Centre and its incubated start-ups operate out of the IIT Madras Campus and the IIT Madras Research Park.

About IITMadras

Indian Institute of Technology Madras (IITM) was established in 1959 by the Government of India as an institute of national importance. The activities of the Institute in various fields of Technology and Science are carried out in 16 academic departments and several advanced interdisciplinary Research Academic Centres. The Institute offers undergraduate and post - graduate programmes leading to the B.Tech., M.Sc., M.B.A., M.Tech., M.S., and Ph.D., degrees in a variety of specialisations. IITM is a residential institute with more than 580 faculty and 9,500 students. Students from 18 countries are

enrolled here. IITM fosters an active entrepreneurial culture with strong curricular support and through the IITM Incubation Cell.

IITM has been ranked No.1 in the Overall Institutions category in India Rankings 2019 released by National Institutional Ranking Framework, Ministry of Human Resources Development, Govt. of India. The Institute has also been ranked No.1 in the Engineering Institutions category in the same Rankings for four consecutive years – 2016, 2017, 2018 and 2019. It was also adjudged as the 'Top innovative Institution' in the country in the Atal Ranking of Institutions on Innovation Achievements (ARIIA) 2019 launched by Innovation Cell of MHRD.

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