

## AGENDA SUMMARY & HIGHLIGHTS

| <u>Day 1 - 28 Nov 2019</u>   | <u>Day 2 - 29 Nov 2019</u>  |
|--|---|
| <p><b>Session 1 - Inaugural Session: Making Bengaluru a Global EV Hub (10:30 AM – 12 Noon)</b></p> <p>With Bengaluru already becoming the hub of E-mobility for India, what does it take to make the city a global e-mobility hub?<br/>The inaugural panel discussion debates this exciting theme.</p>   | <p><b>Session 1 - Adopting EVs in Corporate/Transport Fleet (10:30 AM - 12:00 PM)</b></p> <ol style="list-style-type: none"> <li>1. Use of EVs in Public/Government fleets</li> <li>2. Use of EVs in Private fleets</li> <li>3. Using EV retrofits as an avenue for fleet electrification</li> <li>4. Strategies for acceleration of EV use in fleets</li> </ol>                    |
| <p><b>Session 2 - Batteries (12:00 PM - 1:30 PM)</b></p> <ol style="list-style-type: none"> <li>1. The EV Battery Value Chain</li> <li>2. Li-ion vs. Lead Acid - Current status and evolving trends for Indian E-mobility</li> <li>3. Deep-dive into Li-ion batteries</li> <li>4. Li-ion battery economics - status and trends</li> <li>5. Enhancing EV battery performance</li> <li>6. Strategizing for the Indian EV battery market</li> </ol> | <p><b>Session 2 - EV Support Ecosystem (12:00 PM - 1:30 PM)</b></p> <ol style="list-style-type: none"> <li>1. Effective research and design support needed to evolve a strong EV ecosystem</li> <li>2. Recycling of Li-ion batteries</li> <li>3. EV training &amp; skill development</li> <li>4. Testing and Standardisation</li> <li>5. The Indian EV startup ecosystem</li> </ol> |
| Lunch ( 1:30 - 2:30)   | Lunch ( 1:30 - 2:30)  |
| <p><b>Session 3 - Charging/Swapping Infra (2:30 PM - 4:00 PM)</b></p> <ol style="list-style-type: none"> <li>1. Trends in AC vs. DC fast charging in India</li> <li>2. Implementing EV charging infrastructure</li> <li>3. Leveraging partnerships to expand EV infrastructure</li> <li>4. Battery Charging vs. Battery Swapping</li> <li>5. Opportunities in Battery Charging/Swapping</li> </ol>   | <p><b>Dedicated Networking Session (2:30 PM - 5:30 PM)</b></p> <ol style="list-style-type: none"> <li>1. Startup Showcase II - 2:30-3:15 - Quick showcases by 10 innovative EV startups</li> <li>2. Delegate Companies Introduction</li> <li>3. Investor Networking</li> <li>4. Multi-Stakeholder Networking</li> </ol>   |
| <p><b>Session 4 - Motors &amp; other Non-Battery Components (4:00 PM - 5:30 PM)</b></p> <ol style="list-style-type: none"> <li>1. Trends in Motors used in electric vehicles</li> <li>2. The indian ecosystem for EV motors &amp; other EV components</li> <li>3. Innovations in EV components and subcomponents</li> <li>4. What can make Make in India a reality for EV components</li> </ol>  |   |
| <p><b>Startup Showcase I: 5:30 - 6:15</b><br/>Quick Showcase by 10 innovative EV startups</p>  |   |
| <p><b>Each session contains a Discussion/Interactions slot for a minimum of 30 minutes, at the end.</b></p>  |   |

*Expert Companies as a part of the summit*



**General Electric**



**Exide - Leclanche**



**magenta**power

**Magenta Power**



**BOSCH**  
Invented for life

**Bosch**



**Fortum**



**Zoom Car**



**Himadri Speciality Chemicals**



**Lightstone Aspada**



**e-Trio**



**Attero**



Sun Mobility



Underwriters Laboratories



CSIR - CECRI



Smado Labs



Energy Alternatives India



Cell Propulsion



Vision Mechatronics



EV Next



Alti Green



Zip Trax



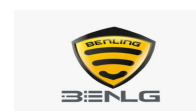
EVQ point



Earth Energy EV



Black & Veatch



Benling India



**Lithion Power**



**Lets Venture**



**Advance Cable Technologies**



**Powergear**

## Session Details

### **DAY 1 10:00 AM – 6 PM**

#### **Inaugural Session: Making Bengaluru a Global EV Hub (10:30 AM – 12 Noon)**

With Bengaluru already becoming the hub of E-mobility for India, what does it take to make the city a *global e-mobility hub*?

The inaugural panel discussion debates this exciting theme.

#### **Panelists**

1. Swaroopa TK – Chief Operating Officer @ Invest Karnataka Forum
2. Narasimhan Santhanam, Director - EV Next
3. Shalendra Gupta, COO – Altigreen

### **12:00 PM - 1:30 PM THEME: BATTERIES**

#### **Experts**

1. Prabhjot Kaur, CEO - Esmito
2. Vikash Chandra, Co-Founder - BPL-FTA
3. Rohan Singh Bais, Product, Strategy & Business Dev- Ziptrax
4. Dr.Rashi Gupta, Director - Vision Mechatronics Pvt. Ltd.
5. Anshul Gupta - Director Okaya Power Group\*

#### **12:00 PM - 12:10 PM:-The EV Battery Value Chain**

- Insights on the Li-ion battery value chain components
- Current supply chain for Li-ion batteries in India and key players
- Current and emerging opportunities in EV battery value chain for Indian businesses
- Status , trends and challenges for raw materials used in Li-ion batteries

#### **12:10 PM - 12:20 PM:-Li-ion vs. Lead Acid - Current status and evolving trends for Indian E-mobility**

- Current status of battery use in EVs - types of batteries used, specifications and challenges faced
- Battery Performance - comparison of Li-ion and Lead acid batteries

- Future of Lead-Acid batteries in EVs
- Trends in Li-ion battery recycling and repurposing

**12:20 PM - 12:30 PM:-Deep-dive into Li-ion batteries**

- Types, features & specifications of Li-ion batteries used currently, for different EVs
- Insights on the main three forms of Li-ion batteries - pouch, cylindrical & prismatic
- Li-ion chemistry used in different EVs - NMC, LTO, LCO, LiFeP...
- Feasibility of Li-ion batteries for heavy vehicles

**12:30 PM - 12:40 PM:-Li-ion battery economics - status & trends**

- Trends in Li-ion battery prices and estimates for the future
- Cost of manufacturing Li-ion battery cells and battery packs
- The economics and business case for Make in India for Li-ion battery cells, battery packs & BMS
- Policy and strategic avenues that can make “Make in India” feasible, especially for manufacturing Li-ion battery cells

**12:40 PM - 12:50 PM:- Enhancing EV battery performance**

- Insights on avenues to enhance battery efficiency and lifetime for electric vehicles
- Battery innovation spectrum in India - across research organizations, academia and industry
- Designing an effective BMS that significantly enhances battery performance

**12:50 PM - 1:00 PM:-Strategizing for the Indian EV battery market**

- The competitive structure of the global EV battery industry
- Insights on how Indian battery majors are strategizing for EVs
- Case studies of international battery innovations
- Possibilities beyond Li-ion batteries
- Potential for hydrogen fuel cells to disrupt the EV battery market

**1:00 PM - 1:30 PM: Discussion among the panelists, and Q&A from audience**

**LUNCH - 1:30 PM -2:30 PM**

**2:30 PM - 4:00 PM THEME: CHARGING/SWAPPING INFRA**

**Experts**

1. Awadhesh Kumar Jha, Vice President - Fortum
2. Maxson Lewis, Managing Director - Magenta Power
3. Yuvraj Sarda, Head of Strategy - Sun Mobility
4. Vijay Anand, Performance Optimization Specialist - Black & Veatch
5. Chandrashekhar Bhide, Co-Founder - Lithion Power

**2:30 PM - 2:40 PM:- Trends in AC vs DC fast charging in India**

- Current status of EV charging infrastructure in India - both AC & DC charging
- Insights on the main EV charging protocols – CHAdeMO, CCS, GB/T, Bharat Charging Standard
- indigeneous EV charging station standards?

**2:40 PM - 2:50 PM:- Implementing EV charging infrastructure**

- Pre-requisites and support systems required for different types of charging stations
- Technology expertise needed for establishing battery charging/swapping business
- Trends in capital & operating costs for AC and DC charging stations, and cost estimates for future

- AC charging stations
- Low capacity (<10 kW) DC charging stations
- High capacity (>50 kW) DC fast charging stations

**2:50 PM - 3:00 PM:- Leveraging partnerships to expand EV infrastructure in India**

- Strategic partnerships with incumbent oil PSUs & retail sector for setting up charging stations
- Partnership with public entities such as municipal corporations, bus/railway stations, metros etc.
- Partnerships with international solution providers for EV charging infrastructure
- Opportunities for solar energy solution providers to integrate solar power in EV charging stations

**3:00 PM - 3:10 PM:- Battery Charging vs Battery Swapping**

- Comparison between battery charging & swapping stations on the following aspects:
  - Time taken for charging
  - Barriers in deploying charging infrastructure
  - Comparative costs of swapping & charging for the end user
  - Comparative costs for setting up charging units vs swapping units
  - Operations & maintenance requirements comparison between the two models
- Trends in charging times, especially DC fast charging times and how it will affect the business case for swapping
- Comparative benefits of battery charging vs battery swapping for different types of EVs (2w, 3w, cars, buses etc)

**3:10 PM - 3:20 PM:- Opportunities in battery swapping / charging**

- Analysis of the value chain components and characteristics of battery charging and battery swapping in the context of business opportunities
- Insights on emerging opportunities for the following business sectors, with case studies or examples:
  - Small businesses
  - Medium & large businesses in related sectors such oil marketing
  - Business in specific sectors such as retail, finance etc
  - Indian companies keen on developing indigenous technology for charging and swapping
- Perspectives on current and evolving business models for charging stations, and the various opportunities arising out of these emerging models:
  - Pay as you go
  - Subscription model
  - Monetizing from advertising at the charging stations
  - Monetizations through innovative partnerships

**3:20 PM - 4:00 PM: Discussion among the panelists, and Q&A from audience****4:00 PM - 5:30 PM THEME: MOTORS & OTHER NON-BATTERY COMPONENTS****Experts**

1. Manikandan P, Head of Electrification - Bosch
2. Sudhakar Ganganna, Co-founder, Product Architect - Amberroot systems
3. Manohar Bethapudi, AGM - Himadri Speciality Chemicals
4. Siddharth Jain, President - Advance Cable Technologies

5. Subramanian K, CEO - Powergear

**4:00 PM - 4:10 PM:- Trends in motors used in electric vehicles**

- EV motors for 2w, 3w, cars & heavier vehicles - types, features and specifications
- Emerging trends in EV motor technology
- Trends in BLDC motors, induction motors, permanent magnet motors
- Contribution of motors to electric vehicle costs and avenues for cost reductions

**4:10 PM - 4:20 PM:-The Indian ecosystem for EV motors & other EV components**

- Current manufacturing ecosystem for EV motors in India, and prominent vendors
  - Current manufacturing ecosystem for EV components
  - Creating a sustainable manufacturing ecosystem for EV motors and other components
  - Quality & cost comparison of Indian EV components compared to those from China, EU, North America.
- Trends and opportunities in EVs components for Indian auto component manufacturers
  - Opportunities in metals and other raw materials
  - Opportunities in sub-components specific to EV components
  - Opportunities from customization needs for components used in EVs

**4:20 PM - 4:30 PM:-Innovations in EV components and sub-components**

- International innovations in the following EV components and their sub-components
  - Motor controller
  - Inverters
  - Charge controller
  - Transmission

**4:30 PM - 4:40 PM:-What can make 'Make in India' a reality for EV components**

- Insights on the levers and drivers to facilitate indigenous production of EV components
  - Central & state policies & incentives
  - Creating EV manufacturing clusters
  - Learning from the success of India's auto component industry
  - Enabling a level playing field for competing with China

**4:40 PM - 5:30 PM: Discussion among the panelists, and Q&A from audience**

**5:30 PM -6:15 PM Startup Showcase | Prominent Startup Companies:-**

1. Latif Ameer Babu, Director - EVQ Point
2. Paritosh Dey, CEO - Benling India
3. Ashin Muhammad, Co-Founder - Smado Labs
4. Rushi Shenghani, Founder - Earth Energy EV

Quick showcase by 10 innovative EV startups; this showcase session will feature from:

- Niche & specialty electric vehicles
- Batteries & battery management
- Motors & motor controllers
- EV design

**END OF DAY 1**

**DAY 2 10:30 AM – 5:30 PM**

**10:30 AM - 12:00 PM *THEME: ADOPTING EVs in CORPORATE/TRANSPORT FLEET***

***Experts***

1. Sudhindra Reddy, COO - Zoom Car
2. Uttiya Mukherjee, Senior Manager - e-Trio
3. Ashwin Mahesh, Co-Founder - Lithium Urban Technologies
4. Supratim Naskar, CTO - Cell Propulsion

**10:30 AM - 10:40 AM:- Use of EVs in public/government fleets**

- Public transport buses
- Central and state government fleets
- Opportunities for use of EVs in defense sector
- Fleets of public service vehicles such as waste transport, etc.

**10:40 AM - 10:50 AM:- Use of EVs in private fleets**

- Corporate employee fleets, especially bus fleets
- Fleets for food operators, E-commerce companies, logistics providers
- Electric 2w, 3w and 4w as part of sustainable taxi fleets in urban regions
- Economics and business models that can facilitate electric trucks to become a reality in India

**10:50 AM - 11:00 AM:- Using EV retrofits as an avenue for fleet electrification**

- Current status of EV retrofits in India
- Business case for EV retrofits for fleets - 2w, 3w & 4w fleets
- Technology & process inputs for EV retrofits
- Technical and operational challenges for EV retrofits
- Economics of EV retrofits

**11:00 AM - 11:10 AM:- Strategies for acceleration of EV use in fleets**

- Business models for the use of EVs in fleets - Capex & Opex models, aligning EV use with CSR etc.
- Partnerships of electric vehicle rental & sharing companies with hotels, hospitals, etc.
- Partnerships between corporates, OEMs and service providers for adoption of EVs in fleets
- Indian and international case studies for use of EVs in fleets

**11:10 AM - 12:00 PM:Discussion among the panelists, and Q&A from audience**

**12:00 PM - 1:30 PM *THEME: EV SUPPORT ECOSYSTEM***

***Experts:-***

1. Manjunath V, Standards & Program Manager - UL
2. Sukla Chandra, Senior Managing Director - GE
3. Nitin Gupta, CEO - Attero
4. Shanti Mohan, Founder - Lets Venture
5. Vignesh Nandakumar, Partner - Lightstone Aspada



**12:00 PM - 12:10 PM:- Effective research and design support needed to evolve a strong EV ecosystem in India**

- Design support needed for
  - Vehicle conceptualization and design:
    - Higher range
    - Differentiating features for premium end user segment
  - EV motor, motor controller & other motor components
  - Battery pack & BMS design
- EV charging & battery swapping station design

**12:40 PM - 12:50 PM:- Trends, opportunities & challenges in Li-ion battery recycling**

- Optimal technology and process routes for Li-ion battery recycling
  - Status of global technologies in Li-ion battery recycling
  - Effective recycling technologies and processes for India
  - A virtual walk through of a real-life Li-ion battery recycling process
- Market potential for battery recycling
  - Current & emerging market drivers & trends
  - Government policies and mandates
- Challenges
  - Technical & operational challenges
  - Cost & economic challenges

**12:10 PM - 12:20 PM:-EV training & skill development**

- Current status of skill development infrastructure in India for EV and EV component design & manufacturing
- Types of partnerships needed for establishing effective training and skilling infrastructure
- Emerging opportunities for select sectors and domains in EV sector skill development
- Role of academia and research organizations in developing a skilled workforce for the evolving EV ecosystem

**12:20 PM - 12:30 PM:- Testing & Standardization**

- Relevance and significance of testing and standards for electric vehicles and batteries
- Current testing & standardization infrastructure available, and norms for, the following EV value chain components:
  - Electric vehicles
  - Batteries
  - EV charging infrastructure
- Government organizations and private companies involved in providing support for EV testing and standardization

**12:30 PM - 12:40 PM:-The Indian EV startup ecosystem**

- Special focus on the Indian EV startup scenario with highlights on the following dimensions:
  - Government policies & incentives for EV startups
  - Incubation support ecosystem currently available for EV startups in India
  - Case studies highlighting evolution and growth of prominent EV startups

**12:40 PM - 1:30 PM: Discussion among the panelists, and Q&A from audience**

**LUNCH ( 1:30 PM - 2:30 PM)**

## **2:30 PM - 5:30 PM DEDICATED NETWORKING SESSION**

A key objective of Power2drive is to enable strategic business connections between diverse stakeholders. To this end, we have dedicated 3 full hours of the conference for networking alone.

In order to ensure that the networking takes place in an effective, focussed and productive manner, the networking session is designed to facilitate relevant connections. This is ensured through the following dimensions:

- **Startup Showcase II - 2:30 PM - 3:15 PM**
  - 10 innovative startups will be provided brief introductions at the start of this networking session. This enables delegates to interact with relevant startups during rest of the networking session. Quick showcase by 10 innovative startups from:
    - Startups from e-fleets
    - EV charging & battery swapping
    - Vehicle design
    - EV retrofit startups
  -
- **Delegate Companies Introduction - (3:15 PM - 3:30 PM) 15 minutes, right after the Startup Showcase**
  - Quick , custom introduction for delegates representing companies with specific offerings for the EV sector. These companies will be selected based on inputs provided by the delegates on the first day. We expect 20-25 companies introduced in this session. This introduction will once again facilitate focussed networking between these vendor companies and delegates looking for these offerings.
- **Investor Networking (3:30 PM - 4:00 PM)**
  - Delegates will be provided with customized access to corporate, financial investors attending the conference. Prospective investors will be identified prior to and during the event, and will be provided custom assistance in order to connect them with delegates, startups and others relevant to them.
- **Multi-stakeholder Networking (4:00 PM - 5:30 PM)**

**END OF DAY 2**