



POWERTECH

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ELECTRIC VEHICLES



Electric Vehicles

In February's Newsletter, we bring varied information regarding **Electric Vehicles**.

1. Websites
2. Informative Articles
3. Research Articles
4. Webinars



Electric Vehicles

Electric Vehicles

- **Challenges:** Electric Vehicles have been showing a feasible and ecologic solution for decarbonization. However, there are still some challenges slowing down its wide utilization and acceptance. The high initial cost, lack of charging stations, and charging time are factors impacting the customers' acquisition. On the utilities side, the large amount of EVs integration can bring several impacts on energy supply, lines congestion and power quality.
- **Solutions:** Most of the time, EV are shiftable loads, that can be charged when is more technically and economic feasible. The charging management can not only minimize energy costs for EV users by also provide ancillary services to the systems, support voltage and frequency control. By this, EV management can be beneficial for both users and utility.
- **Gaps:** Coming in March's Edition



Electric Vehicles

1. Websites

- **Name:** EVAdoption

Content: Provides data-driven analysis and forecasts combined with thoughtful insights to industry observers and those companies and organizations that are helping to drive the transition to EVs – or those being affected by it.

Website: <https://evadoption.com>

- **Name:** Green Cars Report

Content: Source for Green Car Info, Reviews, and More. Read reviews, first drives, gas mileage news, photos & specs of high-MPG vehicles. Read news and updates on plug-in hybrids, electric cars, fuel cells, etc.

Website: <https://www.greencarreports.com>



Electric Vehicles

2. Informative Articles

- **Title:** “Volkswagen falls further behind Tesla in the race to electric”

Summary: In total, Tesla (TSLA) boosted its deliveries last year by roughly 436,600 compared to an increase of 220,900 for the Volkswagen Group (VLKAF), which owns brands including Audi, Porsche and Skoda. Tesla has forecast that with new factories near Austin, Texas, and Berlin starting full-scale production in 2022, it should have annual global sales growth of 50% or better for at least the next few years.

Website:

<https://www.cnn.com/2022/01/13/business/tesla-volkswagen-electric-cars/index.html>

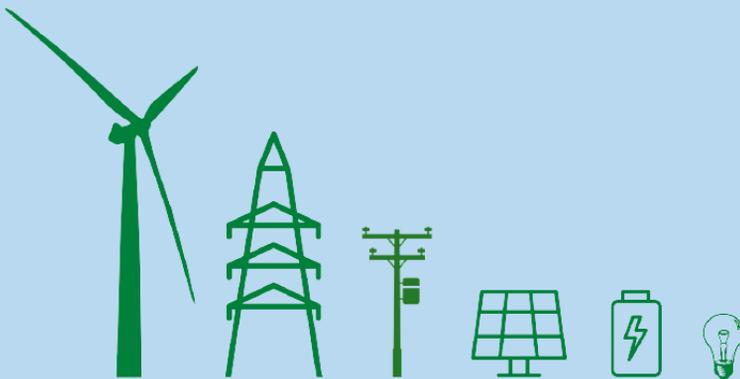


Electric Vehicles

- **Title:** “Venting for EV Battery Packs”

Summary: EV batteries present unique venting challenges including potentially dangerous thermal runaway conditions. Considering these challenges, integration of design, manufacturing, installation, and testing are crucial to optimal EV battery venting performance. Dual-stage venting provides an effective solution to the unique challenges of EV battery packs. The first stage — passive venting — handles gradual changes in temperature and pressure via the ePTFE membrane. The second stage — active venting — allows the vent to rupture and gases to quickly escape in a thermal runaway situation.

Website: [Link](#)



Electric Vehicles

3. Research Articles

- **Title:** “Adaptive Nonlinear Control of Unified Model of Fuel Cell, Battery, Ultracapacitor and Induction Motor Based Hybrid Electric Vehicles”

Contributions: Fuel cell hybrid electric vehicles (FHEVs) have attained importance in automotive industry. Hard driving conditions like steep areas, slippery roads and rough terrains boost up the nonlinearities present in vehicle's model. Proposed controllers have been simulated on MATLAB/Simulink.

Available at:

<https://ieeexplore.ieee.org/document/9400350>



Electric Vehicles

- **Title:** “Transmission Efficiency of Different Shielding Structures in Wireless Power Transfer Systems for Electric Vehicles”

Contributions: Wireless Power Transfer (WPT) charging systems can cause eddy loss on the steel part and the chassis of an EV. By arranging specialized size annular aluminum plates between the chassis and ferrite core, the eddy losses can be effectively shielded. The optimized ferrite bar structure and its EMC characteristics also studied.

Available at:

<https://ieeexplore.ieee.org/document/8993689>



Electric Vehicles

- **Title:** “Control strategies of different hybrid energy storage systems for electric vehicles applications”

Contributions: Choosing an appropriate control strategy for HEV applications becomes complicated. Relative analysis among different control techniques is carried out to illustrate pros and cons. The study also analyzes the experimental platform, amelioration of driving cycles, and mathematical models of each control technique.

Available at:

<https://ieeexplore.ieee.org/abstract/document/9389539>



Electric Vehicles

4. Webinars

- **Title:** “Integration of Electric Vehicles: Technology Update, Impact on Utility T&D System, Current State and Future Trends”

Scope: This webinar provides an overview of the integration of Electric Vehicles; key technology Updates, their impact on Utility T&D Systems, the current state of EVs and future trends.

Available at:

https://resourcecenter.ieee-pes.org/education/webinars/PES_ED_CEP_102721.html



Electric Vehicles

- **Title:** “Impact of electric vehicle charging on distortion levels in distribution networks (Results from simulation and measurement)”

Scope: Measurements in networks with high penetration of Electric Vehicle have shown that the charging clearly dominates the existing distortion levels. Due to design differences (converters™ architecture and control), the emission of different cars usually deviates significantly from one to another, which is a major challenge from modelling and simulation perspective. This panel gives a systematic overview of the distortion characteristics of Electric Vehicle charging and its possible impact on the distribution networks.

Available at:

https://resourcecenter.ieee-pes.org/conferences/general-meeting/PES_CVS_GM21_0828_2888.html



Electric Vehicles

- **Title:** “Grid Integration of Distributed Energy Resources and Electric Vehicles”

Scope: Grid Integration of Distributed Energy Resources and Electric Vehicles

Available at:

<https://resourcecenter.ieee-pes.org/conferences/isgt/PESLI2120.html>





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