



POWERTECH

NEWSLETTER OF IEEE PES YP

Volume 2 • Issue 1 • January 2022

ELECTRIC VEHICLES



Electric Vehicles

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

1. Websites
2. Informative Articles
3. Research Articles
4. Standards
5. Events



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:** Coming in February's Edition
- **Gaps:** Coming in March's Edition



Electric Vehicles

1. Websites

- **Name:** InsideEVs

Content: Not only publish the breaking news of the day, but go behind it, create it, and examine the how, what and why of electric vehicles.

Website: <https://insideevs.com>

- **Name:** Electrek

Content: News, reviews, and analysis of the electric vehicle market. The website provides coverage of the entire sustainable ecosystems and related products.

Website: <https://electrek.co/>



Electric Vehicles

2. Informative Articles

- **Title:** “Electric vehicle fires are rare, but hard to fight — here’s why”

Summary: Vehicles with lithium ion batteries can be especially dangerous when they catch fire. Research by another firm, AutoinsuranceEZ, says battery electric vehicles have just a .03% chance of igniting, compared to internal combustion engine vehicle’s 1.5% chance. Hybrid electrics, which have both a high voltage battery and an internal combustion engine, have a 3.4% likelihood of vehicle fires according to their study. Lithium ion battery cells have electrodes placed close together, which increases the chances of a short and they are filled with a flammable liquid electrolyte.

Website: <https://www.cnbc.com/2022/01/29/electric-vehicle-fires-are-rare-but-hard-to-fight-heres-why.html>



Electric Vehicles

- **Title:** “The pandemic has been great for electric car sales”

Summary: Global sales of battery electric vehicles increased to 4.5 million last year from 2.1 million in 2020, according to data from consultancy LMC Automotive. Electric cars made up 6.3% of global vehicle sales in 2021, tripling their market share from 2019, before the coronavirus pandemic. While electric vehicles charged ahead last year in Europe and China, taking 10% and 12% of market share respectively, electrics accounted for just 3% of US sales.

Website: <https://www.cnn.com/2022/01/26/cars/electric-car-sales/index.html>



Electric Vehicles

- **Title:** “Toyota is spending \$35 billion on electric cars to close gap on rivals”

Summary: The world's biggest carmaker announced that it would invest 4 trillion yen (\$35.2 billion) in developing battery-powered electric vehicles between 2022 and 2030 in a bid to mount a more serious challenge to rivals such as Tesla (TSLA), GM (GM) and Volkswagen (VLKAF). The Lexus luxury brand is a huge part of the new plan, with Toyota projecting 1 million global EV sales by 2030. Toyota wants all Lexus sales in Europe, North America and China to be battery-powered electric vehicles by the end of this decade, and globally by 2035.

Website:

<https://www.cnn.com/2021/12/14/business/toyota-electric-vehicles-lg-batteries-intl-hnk/index.html>



Electric Vehicles

3. Research Articles

- **Title:** “ACN-Sim: An Open-Source Simulator for Data-Driven Electric Vehicle Charging Research”

Contributions: ACN-Sim is a data-driven, open-source simulation environment designed to accelerate research in the field of smart electric vehicle charging. It models the complexity of real charging systems, including battery behavior and unbalanced three-phase infrastructure. The framework also integrates with grid simulators like MATPOWER, PandaPower and OpenDSS.

Available at:

<https://ieeexplore.ieee.org/document/9509290>



Electric Vehicles

- **Title:** “Multivariate Deep Learning Approach for Electric Vehicle Speed Forecasting”

Contributions: Speed forecasting has numerous applications in intelligent transport systems' design and control. In the field of electromobility, it represents the most dynamic parameter for efficient in-vehicle energy management. A speed forecasting method based on the Long Short-Term Memory (LSTM) is introduced.

Available at:

<https://ieeexplore.ieee.org/document/9321203>



Electric Vehicles

- **Title:** “A Comprehensive Review on Structural Topologies, Power Levels, Energy Storage Systems, and Standards for Electric Vehicle Charging Stations and Their Impacts on Grid”

Contributions: A Comprehensive Review on Structural Topologies, Power Levels, Energy Storage Systems, and Standards for Electric Vehicle Charging Stations and Their Impacts on Grid.

Available at:

<https://ieeexplore.ieee.org/document/9536577>



Electric Vehicles

4. Standards

- **Title:** “EV charging stations and modes: International standards”

Contributions: The present paper deals with an overview on different types of EVs charging stations and a comparison between the related European and American Standards.

Available at:

<https://ieeexplore.ieee.org/document/6872107>



Electric Vehicles

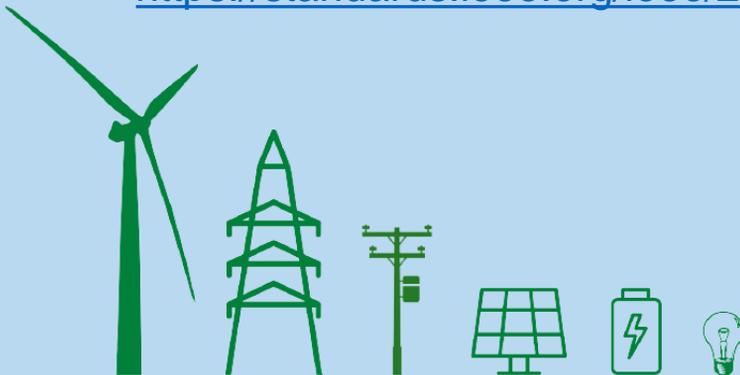
- **Title:** “IEEE Standards associated with Electric Vehicles”

Contributions: IEEE standards association plays important role in the deployment of safe and efficient DC rapid EV chargers. The IEEE 2030.1.1 standard specifies the design interface of electric vehicles and direct current (dc) quick chargers that promote interoperability and rapid charging of electric vehicles. IEEE 2030.1.1-2021 is the latest draft standard that is approved by IEEE SA and in accordance with IEEE P2030 that provides alternative approaches and best practices for achieving smart grid interoperability.

IEEE P2030.1.2 will allow power ratings of 500 kW or more, enable dynamic current control and bi-directional charging (for vehicle-to-home, vehicle-to-building, and vehicle-to-grid power transfers), be backward compatible with existing DC fast charging standards

Available at:

<https://standards.ieee.org/ieee/2030.1.1/5833/>



Electric Vehicles

5. Events

- **Title:** “WIP FM 113.0”

Scope: With the focus on introducing the technical leaders in Power and Energy, creating awareness on the different opportunities in this sector, providing industry and academic exposure, inspiring, motivating and encouraging young minds through the experiences of resource persons, a monthly talk show named WIP FM 113.0 was initiated in September 2021. The chat show is scheduled on the first Saturday of every month at 1 PM (UTC).

Next Episode: 5th of February 2022 at 1 PM (UTC).

Available at:

<https://www.youtube.com/watch?v=A62VOFFXa0Y>



Electric Vehicles

- **Title:** “She4Her”

Scope: She4Her is a one-to-one mentor-mentee program initiated for providing an opportunity to female professionals in developing their technical, managerial, leadership and soft skills. The program aims to bring leading experts from the various domains of Power & Energy to up skill young female engineers, motivate and encourage them to excel in their career. Five mentors and mentees have been selected from across different regions.

Topics covered:

1. AI Applications to Power Systems;
2. Digital Twin;
3. Power System Protection & IEC 61850;
4. Professional Development;
5. Electric Vehicles & Its Impact on Grid Integration.





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