



# EVCONNECT

Issue - 28 | September 2021 | *For private circulation only*

NEWSLETTER

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## FROM THE CEO'S DESK

Dear Friends,

I invite you to explore the 28th issue of EV Connect, our monthly electric mobility focused newsletter.

In this edition, we connect with Mr. Raghu Kerakatty (Cofounder & CEO, Toutchec) as he discusses the role of electric bicycles in accelerating electric mobility in India. Along with our regular news updates, from national and global frontiers, we have a special feature on how solid state batteries will make electric vehicles better.

Various developments are taking place in the electric mobility ecosystem, and it is often difficult to keep up with them. We hope this curated and compiled newsletter will come in handy to those who are seeking the latest information on electric mobility.



Sincerely,

**Dr. OP Agarwal**  
CEO, WRI India

## WATCH

Presenting Power Talk – EV Connect's exclusive monthly interviews with experts, policymakers and stakeholders discussing key insights. We also present one hand-picked video that showcases a global EV innovation.



**Power Talk with Raghu Kerakatty**  
Cofounder & CEO Toutchec



**The Future of Electric Trucks**  
Undecided with Matt Ferrell





# POWERTALK

## In Conversation with Raghu Kerakatty

Cofounder & CEO, Toutchec

*Interview taken by Amit Bhatt, WRI India*

"In case of electric bicycles, no charging network is required, hence there is no issue of range anxiety which in turn propels people to buy the product."

"An e-cycle is the only electric vehicle that has pedals. So, it brings the natural dimension of an active lifestyle into it. It has the potential to change people's lives."

**Interviewer:** You have been involved with 'TrinTrin,' the Public Bike Share (PBS) system of Mysuru. Can you tell us about the program?

**Mr. Kerakatty:** The 'TrinTrin' program, which started in 2015 was indeed India's first bicycle-sharing program, it was funded by The World Bank. At that time, we were testing electric bicycles across Mysuru. However, the program was more focused on the use of regular bicycles. With Toutchec, we were looking at making electric bicycles personal mobility vehicles. We were very excited to be a part of the program as it provided us with the opportunity to create an impact, among the local community, about electric bicycles.

**Interviewer:** Do tell us more about Toutchec's journey.

**Mr. Kerakatty:** Climate change is a much bigger issue, but there are many smaller problems like traffic congestion and degrading air quality which affects health and well-being. In 2018, we started Toutchec Electric which is an electric mobility venture based in Bengaluru and Mysore. The aim to start Toutchec was to go back in time when we used small economical vehicles. People couldn't afford to buy cars back then and personal transport largely consisted of two-wheelers. Also, while planning land transport, it is very important to keep in mind, road space per person. We wanted to develop smaller, smarter and non-polluting vehicles integral to the future urban land transport blueprint.

**Interviewer:** What made you choose electric bicycles as an entry point when there is a bigger buzz around electric cars and electric two-wheelers?

**Mr. Kerakatty:** Electric bicycles are key to building sustainable living spaces. Globally, the concept of hyperlocal neighborhoods is taking root, that is cities where your commute will just take 15 to 20 minutes by foot or by bike. So, sustainable living spaces require bikes and electric bikes. Secondly, it is a fantastic product market that has the potential to fit in to any geography. For instance, in a developed economy like UK, Europe, North America, it serves a different purpose. While for slightly underdeveloped economies like parts of Asia and Africa, it serves a totally different purpose. It has the potential to change people's lives. And lastly, it is the only electric vehicle which has pedals. So, it brings the natural dimension of an active lifestyle into it.



**Interviewer:** In India, most electric bicycles are regular bicycles that are retrofitted to make them electric. How is Toutchec electric bicycles different from them?

**Mr. Kerakatty:** The buzz around electric bikes in India is happening at a lower price point that compromises the quality of the product. We all know that battery pricing is one of the major issues towards EV acceleration. However, we think that if we deliver a quality product at a good price point, people will buy it.

**Interviewer:** What is your take on electric mobility in India? Do you think electric bicycles will create their own niche category altogether?

**Mr. Kerakatty:** The electric mobility market in India is booming like a hockey stick curve and there is a lot of interest. Furthermore, the COVID-19 pandemic has also hastened the process. So, if we talk about electric vehicles like cars, two-wheelers and three-wheelers, a robust charging infrastructure is needed for reducing barriers such as range anxiety. However, in the case of electric bicycles, no such charging network is required, hence there is no issue of range anxiety which in turn propels people to buy the product. An electric bicycle can be charged using a regular power socket at home or office or anywhere at all. So, in our opinion, the electric bicycle market will probably grow faster than the rest of the EV market because of its inherent advantages, in terms of infrastructure, charging network etc.





## UPDATES FROM THE WORLD

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### **Toyota to spend \$13.5 billion to develop electric vehicle battery tech by 2030** | *Market Development*

*Summary of news:* Toyota Motor Corp intends to spend more than \$13.5 billion, to develop batteries and its battery supply system, in a bid to take a lead in the key automotive technology over the next decade. In a statement, the firm said that it aimed to slash the cost of its batteries by 30% or more by working on the materials used and the way cells are structured. [Read more](#)

*Takeaways for India:* Battery cost is one of the major reasons for the high upfront cost of electric vehicles. A focus on developing batteries, and their supply system indigenously will help in reducing the cost of the EVs that in turn will lead to an accelerated adoption in India.

### **Xiaomi plans to make electric cars, new business unit formed** | *Market Development*

*Summary of news:* Smartphone developer Xiaomi recently registered its electric vehicle business subsidiary- Xiaomi EV, Inc. - with a capital of 10 billion Yuan or Rs 11,000 crore. The company is likely to produce affordable electric vehicles for its home country China as well as other international markets. [Read more](#)

*Takeaways for India:* The Central government, through its various incentives and schemes, is continuously striving to take the electric vehicle industry forward. State governments are also making efforts to accelerate EV adoption. As more indigenous companies and firms venture into the EV segment, EV adoption will also scale up and help further India's EV ambitions.

### **Israeli company unveils electric vehicle battery that can recharge in 10 minutes** | *Market Development*

*Summary of news:* StoreDot, an Israeli developer of extreme fast-charging (XFC) battery technology for electric vehicles, unveiled the 'world's first' silicon-dominant battery prototype that can recharge vehicles in just 10 minutes. The company's cylindrical cells use a 4680 format (i.e. 46 millimeters wide by 80 millimeters) that is favored by global carmakers, specifically Tesla. [Read more](#)

*Takeaways for India:* Range and charging anxiety have always been a big concern. Developing such technologies will not only help in overcoming this current barrier but will also reduce the apprehension of potential users. This will also enable a rapid transition to a zero-emissions electrified future.





### **First ship, fitted with ZES battery containers, hits the water** | *Market Development*

**Summary of news:** The Dutch company Zero Emission Services (ZES) launched its first ship that contains exchangeable battery containers- ZES packs, onboard, which effectively turns the ship into an electric boat. More than one-third of all goods and 80% of bulk transportation in the Netherlands take place using inland waterways. ZES' goal is to make all inland shipping in the Netherlands emissions-free. [Read more](#)

**Takeaways for India:** India launched its first solar-powered ferry - Aditya - in 2017. States like Kerala and West Bengal are largely dependent on water transport. The government must facilitate increasing the share of inland waterways in the country's modal mix. Such transport modes are not only cheaper to operate but also help in furthering India's zero-emissions mission.

### **UK Government launches app to encourage switch to cleaner vehicles** | *Strategy and Initiative*

**Summary of news:** The 'EV8 Switch' free app, supported with £2.7 million of UK Space Agency funding, calculates how much money drivers could save by switching to an EV. The app also provides details on the carbon savings and air quality improvements as well as locations of the nearest charging points. [Read more](#)

**Takeaways for India:** Developing app-based technologies that provide details of the nearest charging points will help in resolving charging anxiety. However, in a country like India, the availability of robust charging infrastructure is a challenge. The need of the hour is to develop a strong charging infrastructure to boost the adoption of EVs.





## UPDATES FROM INDIA

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### **Assam - 100% of public transport bus fleet and govt vehicles to run on electricity by 2030** |

#### *Policy Initiative*

*Summary of news:* Assam's recently announced EV Policy aims for 25% EV penetration in all vehicle registrations by 2026. As part of the policy, the state plans to convert 100% of its public transport bus fleet into electric buses and all government vehicles into EVs by 2030. The state government is offering a subsidy of Rs 20,000 on two-wheelers, Rs 50,000 for three-wheelers and Rs 1.5 lakh for four-wheelers. [Read more](#)

### **Govt may extend Fame II for purchase of personal electric cars and e-bicycles** | *Strategy and Initiative*

*Summary of news:* Good news for people looking to purchase electric vehicles! The government is planning to extend the provisions of the FAME II subsidy scheme to buyers of passenger cars and electric bicycles meant for personal use. The fresh inclusions would make the current Fame II scheme all-encompassing as it will cover the entire range of electric vehicles — personal, commercial and public transport. [Read more](#)

### **Odisha aims for 20% electric vehicle registrations by 2025** | *Policy Initiative*

*Summary of news:* The Odisha Government recently announced its EV Policy, 2021 that aims to achieve 20% of all vehicle registrations to be EVs by 2025. The policy proposes financial incentives for EV manufacturing, purchases, and scrapping, interest subvention in loans, road tax, and registration fee waivers to attract users. In addition, the state is also planning to promote EV adoption and component manufacturing, including batteries. [Read more](#)

### **Ultraviolette to set up electric bike manufacturing facility in Bengaluru** | *Market Development*

*Summary of news:* Electric vehicle startup Ultraviolette Automotive plans to set up an electric bike manufacturing facility in Bengaluru. The facility will be spread over 70,000 square feet with the capacity of scaling up to 120,000 units annually. The firm will offer job opportunities to local communities and will train over 500 employees on EV manufacturing and assembling over the next five years. [Read more](#)





## **Convert official fleet to EVs: Power Minister issues letter** | *Policy Measures*

*Summary of news:* The Union Minister of Power and New & Renewable Energy, R K Singh, is urging all union ministers and chief ministers to convert their fleet of official CNG/diesel/petrol vehicles to EVs for all official purposes. The initiative aims to serve as an example for the general public and the hope is that it will encourage people to switch over to E-Mobility. [Read more](#)

## **Meghalaya to get its first-ever EV charging station soon** | *Strategy and Initiative*

*Summary of news:* The state-run Power Grid Corporation of India Ltd (PGCIL) recently started work on its first electric vehicle charging station at its office complex in Lapalang, Shillong. The Electric Vehicle Charging Station (EVCS) are being developed under the Faster Adoption and Manufacturing of (Hybrid) & Electric Vehicles (FAME) India Scheme Phase-II. As part of the scheme, PGCIL will be developing 11 EVCS across Shillong city. [Read more](#)

## **Sun Mobility's MaaS to power Zypp Electric vehicles** | *Market Development*

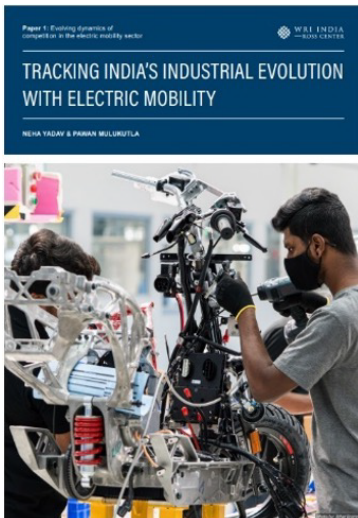
*Summary of news:* Sun Mobility is partnering with Zypp Electric to provide urban last-mile delivery vehicle services. The partnership, which is a MaaS offering, has already deployed electric three-wheeler cargo vehicles in Delhi/NCR and plans to expand to ten other cities soon. [Read more](#)

## **Hero Electric partners with Wheels EMI to offer easy financing options to customers** |

*Market Development*

*Summary of news:* Hero Electric recently partnered with two-wheeler life cycle management company Wheels EMI for offering easy financing to customers buying electric two-wheelers. The partnership also aims to offer extra benefits to Hero Electric customers such as attractive interest rates, flexible tenure options and affordable equal monthly installments (EMIs) among others. [Read more](#)





## BLOGS & INSIGHTS

### Tracking India's Industrial Evolution with Electric Mobility

WRI India identified more than 100 strategic moves made in the Electric Vehicle (EV) industry between 2017 and 2020. Applying a multi-case research methodology, we analyzed 31 of these strategic moves using the Four-Dimensional Framework of Competitive Advantage to observe how firms are choosing to become more competitive as they compete to impact the global EV value chain. [Read more](#)

## WEBINAR

### Building a Sustainable Ecosystem for Electric Vehicle Batteries in India

A resource-efficient transition to electric vehicles requires a sustainable battery ecosystem. The webinar saw various experts talk about how India can scale up its battery manufacturing capabilities and introduce robust standards regulations for safety and performance, while promoting diversification of battery technologies and circular economy strategies. [Watch here](#)



## ARTICLES

### Time for India to shift gears in EV journey: 'Centre must set achievable, time-bound targets'

By Pawan Mulukutla and Madhav Pai | *Express Drives*

In western India, Rajasthan offers subsidies for electric two- and three-wheelers depending on the vehicle's battery capacity. Gujarat aims to have at least 200,000 EVs on the road in four years, with a total budget of Rs 870 crore. [Read more](#)





# EVFEATURE

## How will solid-state batteries make electric vehicles better?

by Tim Kelly and Sayantani Ghosh | September 2021 | This article first appeared in [reuters.com](https://www.reuters.com)

TOKYO/SINGAPORE, Sept 7 (Reuters) - Solid-state batteries could be game changer for electric vehicles (EVs) by storing more energy, charging faster and offering greater safety than liquid lithium-ion batteries, helping accelerate the shift away from fossil fuel-powered cars.

### HOW ARE THEY DIFFERENT FROM LIQUID LITHIUM-ION BATTERIES?

Solid-state batteries use thin layers of solid electrolytes, which carry lithium ions between electrodes. Lithium-ion (li-ion) batteries use liquid electrolytes and have separators that keep the positive electrode from coming in contact with the negative electrode. Currently, solid-state batteries are used in devices such as pacemakers and smart watches. Mass market production of these batteries for EVs is three to five years away, experts say.

### WHAT ARE THE ADVANTAGES OF SOLID STATE BATTERIES?

They are likely to be safer and more stable than liquid li-ion batteries in which the electrolyte is volatile and flammable at high temperatures. This makes electric vehicles that use li-ion batteries more vulnerable to fires and chemical leaks. Increased stability means faster charging and reduces the need for bulky safety equipment. They can hold more energy than liquid li-ion batteries, helping speed up a switch from gasoline vehicles to EVs because drivers would not need to stop as often to charge their cars.

### WHY IS IT DIFFICULT TO MASS PRODUCE SOLID STATE BATTERIES?

Carmakers and technology companies have produced solid-state li-ion battery cells one at a time in a lab, but have been unable so far to scale that up to a mass production. It is hard to design a solid electrolyte that is stable, chemically inert and still a good conductor of ions between the electrodes. They are expensive to fabricate and are prone to



cracking because of the brittleness of the electrolytes when they expand and contract during use. Currently, a solid-state cell costs about eight times more to make than a liquid li-ion battery, experts say.

#### WHO'S TRYING TO MAKE THEM?

Japan's Toyota Motor Corp (7203.T) is one of the front runners to mass produce solid-state batteries. It has said it is struggling with their short service life but still intends to start making them by mid 2020s. [read more](#) In addition to Toyota's in-house research, it has teamed up with Japan's Panasonic Corp (6752.T) to develop these powerpacks with their Prime Planet Energy & Solutions Inc venture. Close on their heels, Germany's Volkswagen (VOWG\_p.DE) has invested in Bill Gates-backed U.S. battery firm QuantumScape Corp (QS.N), which aims to introduce its battery in 2024 for VW's EVs and eventually for other carmakers. VW says the battery will offer about 30% more range than a liquid one and charge to 80% capacity in 12 minutes, which is less than half the time of the fastest charging li-ion cells now available.

Stellantis (STLA.MI), formed in January by the merger of Italian-American automaker Fiat Chrysler and France's PSA, has a venture called Automotive Cells Co with TotalEnergies (TTEF.PA) and a partnership with China's Contemporary Amperex Technology Co Ltd (CATL) (300750.SZ). Stellantis intends to introduce solid-state batteries by 2026. [read more](#)

Ford Motor Co (F.N) and BMW AG (BMWG.DE) have invested in startup Solid Power, which says its solid-state technology can deliver 50% more energy density than current lithium-ion batteries. Ford expects to cut battery costs by 40% by mid-decade. [read more](#)

South Korea's Hyundai Motor (005380.KS), which has invested in startup SolidEnergy Systems, plans to mass produce solid-state batteries in 2030. [read more](#)

Samsung SDI Co Ltd (006400.KS), an affiliate of Samsung Electronics Co Ltd (005930.KS), is working on developing solid-state batteries.

EV market leader Tesla Inc (TSLA.O) has so far not said it wants to develop or use solid-state cells in its cars.

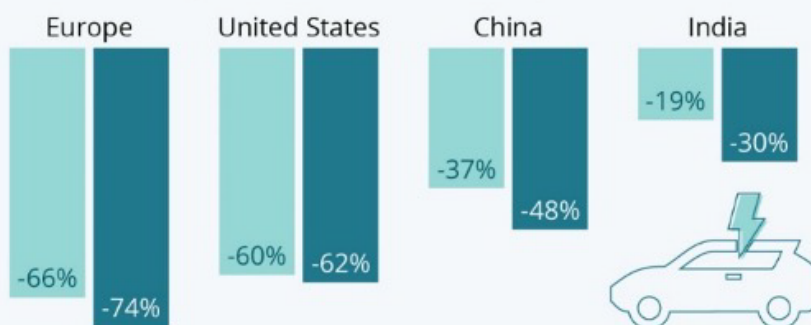


## Electric Cars Found to Cut Emissions Drastically

Estimated reduction in life-cycle greenhouse gas emissions of new medium-size electric cars compared to gasoline cars\*

■ Cars registered in 2021

■ Cars registered in 2030



\* Life-cycle emissions include emissions associated with vehicle and battery manufacture, fuel/electricity production and consumption, as well as maintenance. Figures show lower bound of estimates based on electricity mix according to current policies.

Source: ICCT



statista

Source: Statista



## EV Podcast

**Supercharging EVs: With a revved-up sectoral plan, will consumers embrace the electric vehicle?**

The electric vehicle market in India is revving up. Ambitious plans of product launches and subsidies from the government are helping in making EVs price competitive. But are consumers willing to get into the driver's seat when charging infrastructure is still lagging?

Listen to the podcast [here](#)



## COURTESY FOR THE ARTICLES

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## VIDEO CREDIT

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## ABOUT WRI INDIA

WRI India is a global research organization that turns big ideas into action at the nexus of environment, economic opportunity and human well-being.

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