



# EVCONNECT

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NEWSLETTER

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### EV Feature

Three reasons why Delhi's EV policy can be a gamechanger for India *by Amit Bhatt, Director, Integrated Transport, WRI India.*

## FROM THE CEO'S DESK

Dear Friends,

Wish you a very happy new year 2019.

I am excited to share with you the sixth issue of WRI India's electric mobility newsletter, **EV Connect**.

At the end of last year, we saw COP24 wrapping up with the global adoption of the rulebook to implement the promises made in Paris. Electric mobility gathered substantial attention. Majority leaders, scientists and businesses together agreed that a massive shift in the automobile industry is imminent, and that to foster clean mobility, curb transport emissions and slow climate change worldwide, multiple actors and sectors need to unite. Electric vehicles offer India a unique opportunity to augment its technological prowess, use it to aid social and economic development and curb local pollution and greenhouse gas emissions. Recently, many policy frameworks of the central and state government have been released in India regarding charging infrastructure, key vehicle segments, and how to grow the share of electric vehicles (EV) in cities through public and private sector efforts.

New developments are taking place at a very rapid pace, and it is often difficult to keep up with them. Reported through multiple media channels, such updates are often hard to track. This newsletter seeks to bring together several of these developments into one document. We hope that over time, this curated and compiled content will come in handy to those who are seeking the latest information on electric mobility.

This edition of the newsletter includes a conversation with Project Lithium, a Bengaluru based start-up that provides fully electric corporate fleets. It also features a piece on the recently launched EV policy of Delhi.

We hope that you find this edition of the newsletter beneficial and share your thoughts to improve it.



Sincerely,

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



# POWERTALK

## IN CONVERSATION WITH SANJAY KRISHNAN

FOUNDER, LITHIUM URBAN TECHNOLOGIES, BENGALURU, INDIA

*Interview taken by Amit Bhatt, Director, Integrated Transport, WRI India.*

(Copy-edited for the print version)

“Given the natural arbitrage in a country like India - between hydrocarbon pricing and renewable energy pricing, it is a no brainer that EVs will be the future. Adoption of EVs is not one switch that you put on and it gets automatically adopted across segments.”

“Our customers save upto 40% of the transportation costs, so if other service providers can similarly pass on some of the benefits from EVs from which they save money, back to the customers, I think the adoption will be much quicker.”

**Interviewer:** Can you tell us something about Project Lithium (‘Lithium’ from here on)?

**Sanjay:** Lithium is a 100% EV based mobility as a service company, catering to the corporate employee transportation segment. Think about Ola and Uber, but only B2B and 100% electric, and of course profitable.

**Interviewer:** When did you start and what were the reasons that you chose EV and not conventional vehicles?

**Sanjay:** We started Lithium in October 2014. First revenues were in June 2014, our first contract. Why we started Lithium? Simple macros. We all agree that hydrocarbons are limited in their supply. We all agree that science and scale have reduced the costs of renewables. 50% of the variable costs in transportation is fuel. Therefore, if you were to substitute hydrocarbons with renewables, it is the next killer app. And if there is no tail pipe emission as a result of using renewables, it is a fantastic thing. You get clean air as well. So, reducing transportation costs and providing world class service without any after effects of pollution, those are the macros that we used and we found that Lithium is a great idea.

**Interviewer:** How many vehicles and which geographies are you currently covering with Lithium?

**Sanjay:** So, we have a little over 750 odd vehicles already deployed. We are deploying about 100 vehicles this month. We have vehicles across Bengaluru, Pune, Hyderabad and Delhi NCR, where we service both Noida and Gurgaon.

*Interviewer:* What are the biggest learnings or challenges that you have faced with the operation of vehicles?

*Sanjay:* What we sell at Lithium is essentially productivity. EVs are more expensive than their IC engine counterparts but their running costs are lower. Therefore, in order for us to provide a good value proposition to the clients, we need to ensure that we maximize the potential of the car. No one buys our service because its green, everyone buys it because it is cheaper. Therefore, we need to maximise the electric miles in every car. To do that, we need to sweat the asset, therefore managing the asset. Scheduling the different routes, scheduling the charging times, and ensuring uptime of the charging infrastructure is very important. These vehicles typically do between 300-320 km a day. These are vehicles with about 100 km real range. Therefore, we need to ensure high productivity - we need to ensure the asset life is managed, the charger life is managed and the driver.

The most important part is never sweat. So, we have a unique model in which over a 24 hours period two drivers manage a car. Drivers are the cornerstone of every delivery. Sweating the car doesn't mean that we sweat the driver. We have heard so many stories - such as from safety perspective - the more a driver drives, the more unsafe the journey becomes; the lesser s/he drives, the more productive s/he could be. A driver, like you and me, also has a life and a family. Therefore, our proposition is unique, we ensure both social mobility as well as financial inclusion. What we mean by social mobility is that we have taken about 50 of our drivers and moved them from just being a driver to having managerial jobs at our companies, which gives them a career trajectory.

*Interviewer:* What do you see as the future of electric mobility and what can be done to expedite electric mobility in India?

*Sanjay:* I think electric mobility is the future. Mobility powered by clean energy is the future. Given the natural arbitrage in a country like India - between hydrocarbon pricing and renewable energy pricing, it is a no brainer that EVs will be the future. Adoption of EVs is not one switch that you put on and it gets automatically adopted across segments. We have demonstrated viable adoption in one segment, which is a very large segment. It may not be as big as a B2C, but still a large segment with about half million vehicles. In B2B, there are buses used by corporate employees which I think is a good segment. Last mile first mile, again, is a fantastic segment. Already, there is price parity between IC engine and electric versions in three wheelers. So, if the products are good, if auto drivers gain confidence on the product quality, that adoption will happen.

Buses are probably for the STUs. They'll be the last to happen because of the price differential between their IC engine and electric counterparts. Obviously, the government is trying to narrow the gap through subsidies, but I don't think subsidies are the right way to do it. And last segment is going to be personal mobility, in which vehicles are made with the Indian consumer in mind. It is the most energy inefficient mode of transport with one passenger in one car per journey, I think that will happen the least.

The most rational buyers for whom the benefit of electric mobility translates into lower costs are the ones who will adopt it quicker. The adoption will also depend on those service providers who use the benefit of EVs and pass on this benefit to end consumers. For example, what I mean by that is the ICE price is proportional to distance because of the cost of hydrocarbons. So when we did this service in our B2B segment, we provided unlimited mileage. Therefore, we passed on some of the benefits of an EV to our customers. Our customers save upto 40% of the transportation costs, so if other service providers can similarly pass on some of the benefits from EVs from which they save money, back to the customers, I think the adoption will be much quicker. Therefore, it's not a one to one replacement of IC engine with an electric vehicle. If a new method or a new modality is thought through, then I think adoption will be quicker.



## UPDATES FROM THE WORLD

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### **American Manganese develops technology for battery recycling** | *Technology*

American Manganese Inc, a Canadian company, has won a patent for its novel and inventive battery recycling technology to extract cathode metals such as cobalt, nickel, manganese, aluminium and lithium for use in the manufacturing of new lithium ion batteries. The company will be using the patented technology as an exclusive asset. The recycling technology was developed in response to projected growth in EVs and foreseeable strains in the supply chain of battery raw materials. The company also sees efficient recycling as key to achieving circular economy.

*Takeaway for India:* Battery recycling is a tremendously important area for India, as the country doesn't have indigenous sources of raw materials to locally manufacture batteries. Recycling allows for the retrieval of raw materials for use in new batteries. To gain advantage in business and policies, India's decision makers and industry should focus on fostering recycling technologies. An additional benefit will be the clean disposal of used batteries, which if dismantled in unsafe ways, can lead to the spilling of hazardous materials in water streams. [Read more](#)

### **Warren Buffett-Backed Electric Car Maker BYD Is Planning a 2022 IPO for Its Battery Business** |

#### *Market Development*

BYD Co. in Shenzhen, China is going to list its battery business as public by 2022 to raise funds for its vehicle-battery operations, a spin-off from its existing battery business that targets mobile and automobiles. BYD is basing its business expansion on the fact that batteries will soon revolutionize the automobile industry in over 100 years. Secondly, the company estimates that if the Chinese fleet is to be fully electrified by 2030, it will need to boost its battery manufacturing capacity by about ten-fold to 1000GWh a year. BYD is planning to open battery-making factories in the USA and Europe.

*Takeaway for India:* It is evident that the demand for batteries is soaring globally with the growth of EV fleets. Having a domestic battery manufacturing base is vital for increasing the share of EVs in India. Proactively taking a lead on this is all the more important for the country as it does not have local sources of battery raw materials. This is an area where policymakers could intervene and provide incentives to battery manufacturers, raw material suppliers and other foreign players who would like to partner with domestic players in making batteries. [Read more](#)

## A long-awaited battery that would cut electric-vehicle costs may finally be close |

### *Policy and Market Development*

24M, a battery manufacturing start-up founded by a group of material scientists, will be launching cheaper and better performing batteries than conventional ones in 2020. Although the start-up is late by five years in launching these 'semisolid' batteries, they have a much higher energy density (280-300 Wh/Kg) than those available in the market (250 Wh/Kg). Higher energy density means that the batteries cost less, weigh less and last longer. 24M has raised USD 22 Million in funding which will be used for setting up manufacturing facilities to produce batteries at industrial scale with Japanese partners. Through research and laboratory experiments, the company is pursuing batteries of even higher energy densities. 24M is redefining lithium ion batteries through efficient design, using materials that allows the electrodes to be 4-5x thicker and the removal of nearly 80% of the inactive material, which is saving a number of steps in the manufacturing process and trimming costs.

*Takeaway for India:* Making lithium ion batteries that have high energy density is the top prerogative for countries planning for electrification. Batteries with high energy density are energy efficient and help reduce the lifetime costs of the vehicles. No doubt such battery technologies will be invaluable, but safety measures need to be put in place for their adoption in India. Battery packs heat up while charging and discharging, and even more so in high ambient temperatures such as during summer in Indian cities. Compact batteries do not allow for heat to escape easily and can catch fire. Hence, Indian policymakers and industries working on high energy density must ensure that battery packs are safe and that they demonstrate high tolerance of ambient temperature. [Read more](#)

## Why China's electric-car industry is leaving Detroit, Japan, and Germany in the dust |

### *Policy and Technology*

Since opening the doors of innovation to foreign players in 1980s, China has tried to secure its place as a leader in a variety of technologies. At first, the country bet on producing traditional automobiles, which for the longest time was the forte of North American and European giants. But its products were unable to match the performance of prevailing internal combustion engine vehicles that the Western companies had to offer. Hence, the advent of EVs became an opportunity for the country to take the lead. It is scaling the localized manufacturing and adoption of the EVs at an unprecedented rate, along with phasing out internal combustion engines. EVs are one of the ten pillars of the Made in China 2025 strategy of the state. The country has three times as many battery plants planned as have been established globally. It has further enacted a range of policies to achieve this target. For instance, for consumers, it has abolished one of the most difficult steps in buying a vehicle – the license plate – that is free for EVs. Many industrial groups are now basing their global plans on the development of the industrial policy of China.

*Takeaway for India:* For India, there are many important lessons to be observed in China's EV strategy. Firstly, it has achieved two goals at once, i.e. gaining leadership in EV technologies and battery manufacturing, and managing pollution from vehicles to protect the environmental health of its cities. Secondly, its strategies and policies have empowered domestic and foreign players to set up their manufacturing units for vehicles and batteries locally, and provided incentives for consumers to adopt EVs. While India may focus on different vehicle segments to begin large-scale electrification, this strategy can serve as an example of how multiple environmental and economic priorities have been aligned together holistically. [Read more](#)



## UPDATES FROM INDIA

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### India inks MoU with France for collaboration to boost use of electric vehicles |

#### *Policy and Market Development*

The Union Cabinet of India signed a Memorandum of Understanding between the Solar Energy Corporation of India Ltd (SECI), the Commissariat à l'énergie atomique et aux énergies alternatives (CEA), a French state-owned research entity, and BlueStorage SAS, a French company. The objective is to help the Indian government with growing the share of EVs, minimizing the impact on the power grid and increasing the share of energy drawn from solar. A pilot project is on the cards to set up a charging station with embedded batteries that will be powered by solar panels and connected to the grid. [Read more](#)

### Mahindra, SmartE to deploy 1,000 electric three-wheelers in Delhi NCR | *OEM Development*

Mahindra has signed a Memorandum of Understanding with SmartE, India's largest electric vehicle fleet operator to deploy the first 1000 Mahindra Yaari and Treo electric three wheelers by March 2019 in the Delhi NCR region. By 2020, a total of 10000 electric three wheelers from Mahindra will be deployed throughout the country. By 2022, SmartE aims to deploy 100,000 EVs. SmartE has already partnered with the Delhi Metro Rail Corporation, one of its many partners. It provides nearly 80000 daily rides and has completed 30 million electrical kilometers in the past three years since its inception. SmartE already has a charging network to support 800 vehicles and will be expanding it to support 1000 vehicles. The partnership represents how automakers and the mobility services market is actively helping to solve the last mile connectivity problem in the form of EVs that connect consumers to mass transit. There are double benefits – increased uptake of public transit and reduced dependence on private vehicles that emit pollution and deplete air quality. [Read more](#)

### Companies line up plans for lithium-ion batteries production | *Market Development*

Lithium ion batteries are the preferred technology in India. Localized battery manufacturing is key to a thriving EV ecosystem and all the more for India, which doesn't have any mineral reserves of Lithium and Cobalt. As a positive response to this scenario, multiple players in the auto and energy solutions market have rolled out plans to make lithium ion batteries locally. Many homegrown players have formed partnerships with foreign ones such as LG Chemicals, Toshiba and Denso to import lithium cells and pack them into batteries for EVs. Although the electric vehicle market is only slowly picking up due to high upfront costs and the lack of a charging ecosystem, there

is still a massive market for lithium ion battery packs. For instance, such battery packs are in demand for electric three wheelers, which are already 2.5 million in number. The majority use lead acid batteries which are cheaper but have a far shorter lifespan as compared to lithium ion batteries, creating a massive opportunity for lithium ion batteries. [Read more](#)

## **ISRO shortlists 14 firms for transfer of lithium ion cell technology** | *Technology and Policy*

To help in the creation of an indigenous EV ecosystem, the Indian Space Research Organization (ISRO) will transfer lithium ion cell technology to Indian industries and start-ups on a non-exclusionary basis. ISRO makes lithium ion cells and batteries of various sizes and power for its satellites and rockets. Companies can then set up production facilities and conduct deeper explorations in cell production of various sizes and energy density. Nearly 100 companies had shown interest in the lithium ion battery technology of ISRO and 14 were shortlisted from these. [Read more](#)

## **Electric Car Charging Infrastructure And Guidelines Announced By Government** | *Policy*

The Indian government has announced its policy for the deployment of EV charging stations. To begin with, cities with a population of above four million will be targeted – this includes Mumbai, Delhi, Bengaluru, Hyderabad, Ahmedabad, Chennai, Kolkata, Surat and Pune. Setting up charging stations is a de-licensed activity, a decision that was made to proliferate charging stations in the selected cities. The charging station will be free to obtain power supply from any power company. The power distribution agency will help the charging stations set up an electricity connection on a priority basis. This policy encourages existing petrol stations to set up charging stations. Company owned stations would be given precedence to set up charging stations than privately owned fuel stations. The policy also indicates that there will be at least one charging station in a grid of 3 km in cities, along with the identification of key highway corridors for setting up charging stations for small private and larger commercial vehicles. While private residences have no mandatory requirements on the type of charging station, public charging stations have minimum requirements such as minimum of three fast chargers, one CCS - Combined Charging System style plug, one CHAdeMO, and one Type-2 AC fast charger. [Read more](#)



## **EV @ WRI**

### **Memo to Carmakers: The Future Is Electric**

*by Dan Lashof Dan Lashof and Camron Gorguinpour - October 04, 2018*

Car companies need to stand up for existing emissions standards and for extending the federal EV tax credit, because it's what consumers want and it's the only way to demonstrate that auto-makers are acting in good faith. They should be working hand in hand with consumers, others with a stake in the industry and the environment, to ensure that charging solutions are available for people who can't charge at home. They should also highlight and support government incentives that make EVs more affordable and invest in communications efforts to inspire even more people to join the EV revolution. The future is electric. Car companies need to stop living in the past. [Read more](#)



“Because investors will go where demand is, Delhi’s policy rightly puts the focus on demand creation. First, the policy seeks to rapidly grow Battery Electric Vehicles (BEVs). The goal is to ensure that BEVs make for 25% of all new vehicle registrations by 2023. Second, it absorbs the initial capital dent by giving financial support for adoption of EVs. Third, it proposes to replace old personal vehicles with electric, which will encourage EV adoption.”

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# EV FEATURE

## THREE REASONS WHY DELHI’S EV POLICY CAN BE A GAMECHANGER FOR INDIA

By Amit Bhatt, Director, Integrated Transport, WRI India.

Delhi NCR is in a midst of the air pollution crisis. Studies have shown that vehicle exhaust is responsible for almost a third of particulate matter (PM2.5) concentration in greater Delhi’s ‘airshed’. This is a grave threat to public health quality and local economy of the city. Therefore, cleaning the air would need cleaning of transportation system – in large measures. In fact, most of the progressive cities around the world are looking at developing zero emission vehicle programs through EVs.

EVs may sound futuristic but not anymore, as last year, electric cars crossed 30 lac mark worldwide. In addition, 3 crores two wheelers and 1 lac buses were sold last year, of which majority were in China as the country is proactively pushing electric vehicles due to climate and mobility reasons.

A NITI Aayog report estimated that India can save 64% of anticipated passenger road-based mobility-related energy demand and 37% of carbon emissions in 2030 by shifting to a shared, electric, and connected mobility future.

While electric mobility has become a common topic of discussion in India for the last few years, nothing impactful has come on ground. Less than 0.1% of cars and 0.2% of two wheelers and zero commercial vehicles in India are pure electric. But all this could change, thanks to Delhi’s EV policy. Let me highlight three sides of this new policy:

### 1. Focuses on creating and growing demand

Delhi is not the first state to come up with an EV policy. Karnataka and Telangana were among the first states to come out with an EV policy while other states are in the process of doing so. In terms of actual impact, nothing substantive has changed on ground because the states have mostly been focusing on EVs for attracting investment and creating manufacturing facilities, without looking at creating demand. Because investors will go where demand is, Delhi’s policy rightly puts the focus on demand creation. First, the policy seeks to rapidly grow Battery Electric Vehicles (BEVs). The goal is to ensure that BEVs make for 25% of all new vehicle registrations by 2023. Second, it absorbs the initial capital dent by giving financial support for adoption of EVs. Third, it proposes to replace old personal vehicles with electric, which will encourage EV adoption.

## 2. Looks at how do people travel in Delhi

The modal mix in India is totally different from the west. This difference is even more pronounced in cities like Delhi whose infrastructure and culture are in part state-of-the-art and old and frugal in the other. The EV policy for Delhi has rightly chosen two wheelers, three-wheeler and buses as the drivers for electrification. The policy proposes financial incentive for existing two-wheeler owners who would give up their vehicles for scrapping. The policy not only incentivises purchases of electric autos with swappable batteries but also simultaneously promotes conversion of existing CNG autos to e-autos. An open permit system for e-autos, with no cap on the number of vehicles is a good idea. Improper disposal of lead acid batteries, used in majority of e-rickshaws in Delhi, creates environmental hazards. This policy proposes replacement of such batteries with cleaner and advanced versions. The proposal to convert all public transport buses to electric by 2023 is a great step forward.

## 3. Facilitates creating a strong EV Ecosystem

EV is not a change in fuel, it requires a change in the ecosystem. Therefore, any attempt on promoting EV will necessarily need a change in the eco system. Delhi's policy has some promising ideas to create the EV eco system. The proposal to provide financial support for purchase and installation of private charging points is a very good idea. Similarly, provision of public charging facilities within 3 km travel from anywhere in Delhi is a key highlight of the policy to create a dense charging infrastructure. The policy also invites private sector in setting up a battery swapping business that can be a unique contribution from the industry. The concept of 'urban mining' as suggested in the policy can create new business opportunities and help in the reuse and recycle of EV batteries.

The success of any policy is linked to funding. Therefore, it is hearting to see that the Delhi EV policy has proposed to set up a state EV fund. Pollution cess on all petrol and diesel-powered vehicle; on the sale of fuel beginning with April 2019 is an innovative step. Similarly, an air quality parking surcharge which is proposed to be levied on base parking fee can also generate revenue for the program. The proposal to put additional road taxes on diesel and petrol vehicles, especially on premium cars can also be a good source of revenue and will disincentivise emissions-intensive Internal Combustion Engines (ICE) vehicles.

Stepping away from conventional policymaking is a painstaking effort. Hence, shifting to EVs will not be easy but the benefits of the transition will far outweigh the pain of the transition. Delhi's EV policy is just the timely trigger that the country needs.

## COURTESY FOR THE ARTICLES

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