



EVCONNECT

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NEWSLETTER

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EV @ WRI

How Shenzhen adopted EVs in China and what India can learn from it.

EV Feature

Taking the clue from Chinese model of EV adoption, can India use two-wheelers as catalyst to drive EV penetration?

FROM THE CEO'S DESK

Dear Friends,

It gives me great pleasure to present you with the first issue of our electric mobility newsletter, **EV Connect**.

India is on a cleaner mobility path, and electric vehicles will occupy center-stage in this effort. Though electric vehicles have been talked about for several years, they have become popular more recently, largely driven by falling battery prices, a greater emphasis of electricity from renewable sources, increasing demand for shared mobility, rising concerns about urban air pollution, and a general recognition that oil will not last forever. However, the large-scale adoption of electric vehicles will need several pieces to come together. Among them will be planned charging infrastructure, improved battery technologies, more awareness about electric vehicles amongst consumers, and supporting policies, that allow a nascent technology to compete with the established ones.

New developments are taking place at a rapid pace all over the world. These are reported through multiple media channels and are often hard to track. This newsletter seeks to bring together several of these developments on one platform. We hope that over time, this curated and compiled content will come handy to those who are seeking the latest information on electric mobility.

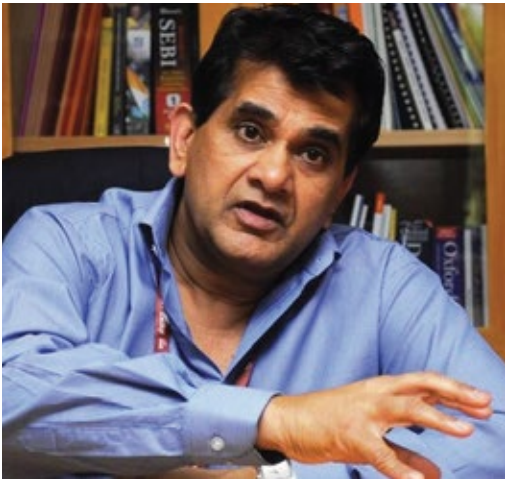
This first edition of the newsletter also includes a conversation with Mr. Amitabh Kant, CEO, NITI Aayog on the importance of electric mobility for India and the way forward. It also features an article by Amit Bhatt, Director, Integrated Transport, WRI India in which the role of two-wheelers as a catalyst in the transition to electric mobility in India is emphasised.

We hope you find this newsletter useful and share your suggestions to improve this newsletter.

Sincerely,



Dr. OP Agarwal
CEO, WRI India



POWERTALK

TOWARDS A SHARED, CONNECTED AND ZERO EMISSION WORLD

CEO, NITI AAYOG

Interview taken by Amit Bhatt, Director, Integrated Transport, World Resources Institute India.

“The future can be a world of electric vehicles, and that is what we should aspire for.”

“While the rest of the world is focussing on cars, we would be focussing on public transport to facilitate shared and connected transport.”



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the full interview [here](#)

Why are electric vehicles important for India’s mobility?

The process of urbanisation has just begun in India, and in the next five decades, India will see about seven hundred million people moving to cities. The challenge for India is to create 2.5 million vehicles in order to facilitate mobility of this population. India cannot follow the approach which America or Europe has undertaken. India needs to have a far more innovative and sustainable approach than the West, because if India were to follow their model, we would need four planets to meet the demand. We need to shift away from Internal Combustion Engines to fully electric-powered vehicles which should eventually move towards shared transport, and a connected and zero-emission world. This would be possible since India has the huge advantage of having only 20 cars per 1,000 people, unlike approximately 950 vehicles in the case of America. The future can be a world of electric vehicles, and that is what we should aspire for.

Do you think electric mobility can be a part of our climate strategy?

Indeed, India is hugely committed to reducing almost 35% of its CO2 emissions, which was committed at the recently held Paris conference, therefore, electric vehicles will play a very major role as we progress along this path. Not merely electric cars, but electric vehicles in public transport and India’s strategy are very different from the rest of the world. While the rest of the world is focussing on cars, we would be focussing on public transport to facilitate shared and connected transport.

What are the key barriers and how can we overcome those for accelerating electric mobility in India?

I am not a great believer in pushing for technology based on a particular substance, for example, Lithium or cobalt. The challenge is that the total cost of ownership of public transportation, including two and three wheelers has substantially fallen. It is on-par with internal combustion engine vehicles. But, that is not the case for cars. We need greater levels of innovation in this space.

The challenge is to bring down the cost of ownership of electric vehicles by bringing down the cost of the battery. Thus, there is a need for greater levels of innovation on batteries so that the cost of batteries come down. Today, we are dependent on Lithium-ion, and India imports Lithium, Nickel, and Cobalt. India is also a heavy importer of oil today. Going forward, India should simultaneously push for renewable energy. In the long run, electric vehicles must be charged by clean power. The challenge here is that renewable energy is a fluctuating power, and India should emphasise the maintenance of a grid, which is capable of absorbing renewable power.

“Going forward, India should simultaneously push for renewable energy. In the long run, electric vehicles must be charged by clean power.”

“By 2026, we would have many foreign OEMs getting into electric vehicles and what they do internationally will have a huge implication for India as well. In India, we need to smoothly move from combustion engines, so that there is an incremental but gradual increase of electric vehicles.”

What’s the role of Government and private sector in advancing electric mobility?

It is more important to understand that the automobile sector, which includes the OEMs (Original Equipment Manufacturers) and component manufacturers, plays a very critical role in India. It accounts for about 49% of manufacturing as well as 7.2% of the GDP (Gross Domestic Product) of the country which creates a vast number of jobs and therefore, whatever we do, it needs to be done in size and scale -- not just for the domestic market but for also penetrating the global markets. By 2026, we would have many foreign OEMs getting into electric vehicles and what they do internationally will have a huge implication for India as well. In India, we need to smoothly move from combustion engines, so that there is an incremental but gradual increase of electric vehicles. It would require us to put up vast charging stations, create the infrastructure or the backend so that they are available across urban areas.

What is the role of a research organization like WRI, in advancing electric mobility?

If we have to accelerate the pace and get manufacturers to move towards electric vehicles, we need to have predictability, consistency, and clarity of policy over a long period, so that there is a smooth transition from internal combustion engines to electric vehicles. The predictability and consistency of policy is very important, and organizations like the World Resources Institute (WRI) have a major and very critical role to play. They are a key player in working in partnership with the government to spell out a policy where the government acts as a great facilitator or as a catalyst. WRI has the ability to scan the globe and see what are the good practices across the world, and how India can benefit from those experiences. I think that is the role which the Government of India would like to play, with WRI as its partner.



UPDATES FROM THE WORLD

The existing policy scenario in US, Norway and China

The white paper report written by American Progress assesses policies that could be effective in increasing light duty plug-in electric vehicles (PEVs). The report surveys the national-level policies in the United States of America, Norway and China, and conducts a qualitative analysis. It concludes that financial incentives for charging infrastructure is one of the effective ways to influence the share of PEVs. The report speaks about a diversified plan of how said markets are planning to increase their EV share. India can explore some of the effective financial incentives presented in this report, particularly related to charging infrastructure, which is a debatable topic in Indian context. [Read More](#)

China electric car execs call for policy support, end to protectionism

China is aggressively pushing new energy vehicles (NEVs) not only to cut smog in congested cities, but also as a strategic industry that will help to boost its firms' global presence. It is now moving to make producers more competitive by phasing out subsidies. However, delegates to China's annual meeting of parliament have urged the state for an overall government subsidy program. The EV market in India is yet to reach maturity, which will only happen if there is a clear policy directive from the central government. In spite of a policy directive at the national level in China, there are certain factors that do not benefit the development of new energy vehicles. India could consider such factors at the early stage of EV adoption, after careful analysis. This will support the development of a robust national EV policy. [Read More](#)

Electric cars to account for all new vehicle sales in Europe by 2035

According to a recent forecast by a Dutch bank, reduced battery costs and economies of scale will drive sales in Europe; however, European carmakers would lose out to rivals in US and Asia. This is also supported by UK's national grid, which expects 90% of new cars in Britain to be electric by 2050. European carmakers are likely to miss out on the upcoming electric revolution, because Asian and American competitors have the advantage in battery technology and electric motors. Europe's competitive advantage in internal combustion engine powertrains disappears with the shift to battery electric vehicles. These trends would mean that despite the current policy and technological challenges that are likely to be overcome in the near future, India could become one of the giants in the EV space. This is indeed, a boost for Original Equipment Manufacturers (OEMs) in India, and the investors that are looking to enter the Indian EV market.

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Global electric vehicle market looks to power up In 2018

According to a report published by Frost & Sullivan, global sales are poised to climb from 1.2 million in 2017 to 1.6 million in 2018, and further upwards to an estimated 2 million in 2019. This will not be an easy ride as the EV industry will have to overcome some of the challenges related to battery technology and charging infrastructure, both of which have failed to match the cracking pace set by EVs. India is rapidly picking up on the EV revolution. The challenges with respect to battery technology and charging infrastructure are looming on the uptake of EVs in India. The good news is that battery technology has been the focus of sustained innovation. Initiatives to develop low-cost, fast charging battery technologies that support long range use looks set to yield promising results in Indian market for uptake of EVs, both in public transport and private vehicle sector. [Read More](#)

The breakneck rise of China's colossus of electric-car batteries

China is currently the largest stakeholder for electric vehicles. China alone has 217.2GWh battery cell production capacity as opposed to rest of the world, with a capacity of 42.4GWh according to Bloomberg's New Energy Finance, Contemporary Amperex Technology Co. Limited (CATL) IPO Prospectus. In China, the source of 99 percent of CATL's business, which is the company's lithium-ion batteries, will be inside locally made EVs from Volkswagen AG, BMW AG, and Hyundai Motor Co. Japan's Toyota Motor Corp. Scaling up the battery capacity in India might take some time because the Lithium batteries prevalent today need Lithium (Li), Manganese (Mn), Cobalt (Co), Nickel (Ni) and Graphite, among other materials. Unfortunately, India does not have any mines for these materials. Moreover, mining alone may not cater to the need of scaling the local manufacturing of batteries in India. As is the case in the solar sector, India might have to enter into a collaboration with Chinese giants like CATL, at least for the initial span of the EV revolution.

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UPDATES FROM INDIA

Electric vehicles in India: The real picture and what to expect by when

The year 2018 begun with electrification of the automotive industry in India. Since the government committed to 100% electrification of all new vehicles by 2032, the automotive sector has been dynamic. This report touches upon some of the critical factors like battery technology, passenger fleets first concept, electric two- and three-wheelers as a means for last-mile connectivity and the path for India to have its first mass-market electric car. [Read More](#)

SUN Mobility to spend ₹16.7 billion on charging infrastructure for electric vehicles

SUN Mobility will be investing ₹16.7 billion (₹1,670 Crores) in the development of charging infrastructure for EVs in Andhra Pradesh. The first city with the pilot project, particularly for electric public transport is Vishakhapatnam. This development will see multiple phases spread over 3-5 years. The charging infrastructure is aimed at catering to the energy needs of public transport, i.e. buses, three-wheelers, four-wheelers and intra-city cargo vehicles. [Read More](#)

Need independent body to promote mass acceptance of electric vehicles, says new report

To boost the mass acceptance of EVs in India, a recent report by a consultancy firm, Mazars, stated that a completely independent body is needed to oversee the design, implementation, running, monitoring and evaluation of the electric vehicle industry. The report also pointed to the direct and indirect subsidies required for consumers and sellers to promote EVs. The report also takes New Delhi as a case study to conclude that EVs can help reduce the gas price by 26.2%. In addition, ridesharing can help reduce pollution, the ownership cost by 69.3% and the congestion cost by 60%. [Read More](#)

Electric vehicles this week: Audi to enter Indian EV market, Andhra Pradesh passes electric mobility policy and more

Audi plans to launch four electric vehicles in India by 2020. The range of the vehicles, as reported in the article, is 400km in single charge. These cars will be launched in cities with adequate availability of charging infrastructure. Meanwhile, the Government of Andhra Pradesh passed an electric mobility policy with the aim to roll out 10 lakh EVs by 2022. The policy provides incentives such as complete reimbursement of road tax and registration fees on EV sale until 2024. [Read More](#)

Government to rope in nodal agencies for electric vehicle infra

The Central government is working with government agencies like NTPC, Power Grid Corporation of India Limited (PGCIL), State Distribution Companies (DISCOMS) and select municipal authorities to identify locations for setting up of charging infrastructure in assigned cities and select highways within one year. These designated agencies will operate the charging infrastructure for at least three years. The government has proposed a grant of ₹1,050 crore for 4,200 public charging points in populated cities and major highways, besides concessional land and local authority support. The cities and highways will be selected by committees at center and state. The committee might opt for bulk purchase of charging infrastructure Energy Efficiency Services Limited (EESL); however, the Department of Science & Technology (DoS&T) is yet to confirm the technology to be adopted for charging infrastructure. Public Sector Units (PSUs) are likely to be tasked with setting up the required initial infrastructure, irrespective of the traffic estimations. [Read More](#)



EV @ WRI

How did Shenzhen, China build world's largest electric bus fleet?

The south-eastern city, which connects Hong Kong to mainland China is one of the world's first cities to electrify 100% of its bus fleet. This post speaks about Shenzhen's success model and how it overcame obstacles like high costs, lack of charging station infrastructure, and more. It also provides lessons for other cities looking to electrify their bus lines. One of the main motivations behind the uptake of electric bus fleet is to meet air quality goals. Four tactics were adopted in the making of world's largest e-bus fleet: national and local subsidies, reduced upfront investments, optimized charging and operation, and the lifetime warranty of batteries. [Read More](#)



“While China has focused on the automobile industry and is using buses to catalyse electric vehicle penetration, the Netherlands has adopted the strategy of creating charging infrastructure to spur growth in electric vehicles. In both cases, the positive economic impact of such measures has led to sustained growth.”

EV FEATURE

INDIA CAN GET ALL PETROL, DIESEL VEHICLES OFF THE ROADS BY 2030. HERE'S WHAT IT WILL TAKE TO GO ELECTRIC.

CHINA USED BUSES AS THE CATALYST TO TRANSITION TO ELECTRIC VEHICLE PENETRATION. CAN INDIA USE TWO-WHEELERS?

Amit Bhatt is Director, Integrated Transport, World Resources Institute (WRI) India.

In April, Piyush Goyal, the power minister at the time, claimed that India would introduce electric vehicles with such vigour that by 2030, there would be no petrol or diesel vehicle left to register. The following month, the Niti Aayog released a report estimating that the country could save around \$60 billion by rapidly adopting electric vehicles. Since then, the subject of electric mobility has featured prominently in the media, eliciting sharp, and often contrasting, reactions from government agencies and automakers.

It would be grossly incorrect to claim that it will be easy for India to make the transition from internal combustion engine automobiles to electric vehicles. However, the benefits will far outweigh the pain of transition, especially given the rapid rise in solar power generation. Still, three fundamental questions need to be addressed if India is to realise its electric mobility dream.

Who will take the lead?

Introducing electric vehicles will require several actors at the national, state and city levels to work together. Nationally, the ministries of road transport and highways, housing and urban development, heavy industries, power, new and renewable energy, foreign affairs as well as institutions such as the Niti Aayog will need to formulate policy and regulations; provide clearances, including for imports; fund and build infrastructure. Since the action will start from cities, state and city administrations will have to be actively involved in developing charging and other infrastructure. Then, there is the question of how to usher in the electric mobility revolution. Two countries that have successfully increased electric vehicles' share in their transport systems have followed different approaches. While China has focused on the automobile industry and is using buses to catalyse electric vehicle penetration, the Netherlands has adopted the strategy of creating charging infrastructure to spur growth in electric vehicles. In both cases, the positive economic impact of such measures has led to sustained growth, with China emerging as the global leader in electric buses and the Netherlands in vehicle charging technologies. In India, the ministries and agencies concerned need to work together to find the right strategy to catalyse the transition to electric mobility. As China has used buses as the catalyst, can India use two-wheelers?

How to tackle the battery challenge?

One of the biggest deterrents to making electric vehicles is the battery, as more than half of a vehicle's cost goes into the battery pack. While the cost of batteries has been falling, it must come down further if electric vehicles are to compete with internal combustion engine vehicles.

India does not manufacture lithium-ion batteries. Indian companies import lithium-ion cells from China and assemble them into battery packs, because setting up a cell manufacturing unit is costly. For long, the battery manufacturing industry was dominated by Japanese and South Korean companies but China is estimated to account for 55% of the global lithium-ion battery production, and this is expected to grow to 65% by 2021.

While India needs to get into battery production soon, it must also secure the supply of materials such as lithium, graphite and cobalt – required for making batteries for electric vehicles – from countries such as Australia, Chile, and Congo. India does not produce enough of these materials. Moreover, India needs to invest heavily in research and development around battery making, including alternative technologies, because whoever controls the battery will control the electric vehicle.

What happens to existing automobile and petroleum industries?

India is the world's fifth-largest automobile manufacturer and the largest manufacturer of two-wheelers. More than 2.5 crore motor vehicles are produced in the country every year. The sector provides employment, directly and indirectly, to nearly three crore people and contributes 7.1% of the Gross Domestic Product (GDP).

As per the Automotive Mission Plan 2016-26, prepared jointly by the Society of Indian Automobile Manufacturers and the government, the Indian automotive market is estimated to be \$16.5 billion by 2021, potentially generating up to \$300 billion in annual revenue by 2026, creating 65 million additional jobs and contributing over 12% to the GDP.

India is also the world's third-largest oil consumer. Its oil demand is expected to grow to 458 million tonne by 2040, while the demand for energy will more than double by 2040 as the economy grows to over five times its current size. It is estimated that 99% of petrol and 70% of diesel consumed by India goes to the transport sector. Clearly, in addition to the automotive sector, any electric mobility revolution will disrupt the oil and gas sector as well. It is important, therefore, to figure out how the existing ecosystem would cope with the change.

The National Electric Mobility Mission Plan 2020, which envisages around seven million hybrid or electric vehicles in the country in the next three years, now appears unachievable. If India is to achieve the goal of fully electrifying its motor vehicle fleet by 2030, it needs to develop a clear road map that addresses the concerns listed above – and it needs to be done now.

NB: This article was first published in scroll.in

ABOUT WRI

WRI 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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COURTESY FOR THE ARTICLES

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