4 **Targets for EV manufacturing:** In addition to incentivizing consumers, states can also push automotive manufacturers towards an electric transition. China and California both have schemes that require automotive manufacturers to achieve a certain share of EVs as part of their annual production or sales. Adoption of such programs can provide a supply-side push to EV manufacturing, which in turn is likely to lead to a greater marketing and sales push for EVs from manufacturers.

GLOBAL TARGETS FOR EV MANUFACTURERS

Targets for EV manufacturing have been effectively used in different countries to ramp up production of electric vehicles.

China's new energy vehicle mandate[19] applies to passenger car manufacturers. New energy vehicles (NEVs), which include battery electric, plug-in hybrid and fuel cell vehicles, are assigned credits, and auto manufacturers have to meet annual mandatory requirements of NEV credits, which are fulfilled by producing or importing NEVs.

California's Air Resources Board has a ZEV program which requires auto manufacturers to produce a number of ZEVs and plug-in hybrids each year, based on the total number of cars sold in California by the manufacturer. Requirements are defined in terms of percent credits, going up from 4.5% in 2018 to 22% by 2025.[20]

The EU has passed a mandate requiring zero- and low-emission vehicles to comprise 15% of automakers' sales by 2025, increasing to 35% from 2030 onward.[21]

5 **Innovation and start-up growth:** The EV industry offers an opportunity for new players to enter the automotive market, and several start-ups are now working on EV manufacturing and battery technology development. While many of them are currently small enterprises, at least a few are likely to grow and establish significant production facilities in the near future. By providing a strong support ecosystem for start-ups, states without traditional automotive clusters can foster greater innovation in electric mobility. Dedicated electric mobility incubators, shared prototyping and manufacturing facilities combined with robust R&D programs can help states reap the benefits of a still-nascent EV industry.

6 **Support for industry-academia partnerships:** State policies include incentives for skill development and research, but do not adequately support ties between industry and academia, which can act as a catalyst for the development of competitive industrial clusters. State governments are ideal stakeholders to support strong academia-industry linkages in two ways: (i) through the creation of autonomous parastatal agencies that can help form a consortium of academics, researchers, manufacturers and industry bodies dedicated to the EV industry, and (ii) through strategic regional development that brings together premier academic and research institutes with industrial and manufacturing facilities, generating positive feedback loops that attract productive companies and a talented workforce to create industrial clusters.

[19] https://www.sustainalytics.com/esg-blog/how-chinas-electric-vehicle-policies-have-shaped-the-ev-market/

[20] https://ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-program/about

[21] Transport & Environment. July 2019. Electric surge: Carmakers' electric car plans across Europe 2019-2025. Available at: https://www.transportenvironment.org/sites/te/files/publications/2019_07_TE_electric_cars_report_final.pdf

LOOKING AHEAD

5.

This review highlights that state governments, with their EV policies, have started taking definitive steps towards transport electrification in their regions. The state EV policies employ a range of incentives and measures to address barriers to EV penetration and to support the different pieces of electric mobility development. While there is some disparity between states in the quality of incentives defined, and some states have focused more on one aspect of the ecosystem over another, the policies provide a good starting point for meaningful state-level action on electric mobility.

States with existing EV policies are now beginning the process of revising and implementing them. At the same time, more states aim to draft and notify their own EV policies. The preceding chapters of the report focus on the three key pillars of a comprehensive EV ecosystem, with specific analyses and recommendations on policy incentives and regulations for consideration and deployment. In concluding this review of state EV policies in India, there are five takeaways for states to keep in mind for effective formulation and execution of policies.

1 **Link the policies with objectives and targets:** Clearly defined objectives to be achieved through EV policies, and targets to aim towards in achieving the objectives, are necessary for the design of effective policy. While many state EV policies have stated objectives and targets, they are neither holistic nor connected to the incentives themselves

2 **Ensure that the recommended policies are limited and specific:** Incentives vary widely in their degree of specificity across the state policies. Moreover, some state policies mention a wide array of incentives without defining the means of implementation. Keeping policy incentives limited and specific will help in financing and implementing them.

3 **Create an execution roadmap:** Objectives and targets are meant to be achieved over a 5- or 10-year period. States must define interim targets, steps to deployment and review mechanisms to provide a roadmap for on-ground stakeholders implementing the policies.

4 **Establish governance structures for implementation:** Some state policies highlight nodal departments for different aspects of implementation. Other states have formed EV steering committees to oversee inter-departmental coordination and policy execution. Most governance structures end at the state level, however, without adequate devolution to the local level. Capacity-building and establishing lines of accountability from the ground up will support more comprehensive deployment of the EV policies

5 **Allocate or plan for fiscal resources to fund policy incentives:** Several state EV policies have recommended subsidies and tax exemptions as catalytic incentives for promoting the EV sector, both among consumers and manufacturers. In the absence of funding allocations from the state government, however, these recommendations remain on paper, with delayed implementation. Fiscal planning to fund incentives with specific revenue streams or predictable state budget allocations will be essential for nodal departments and agencies to move forward assuredly on deploying incentives.

As we enter the new decade, decisive and urgent action will be needed to achieve the target of 30% electric vehicles by 2030 in India. At the end of the day, the formulation and notification of an EV policy is only one piece of a large puzzle. States must realize the potential for economic and environmental gains from the budding electric mobility ecosystem and move towards implementation with strong political will and coordinated multi-stakeholder action.

AUTHORS

Chaitanya Kanuri, Rohan Rao, Pawan Mulukutla

SUPPORTED BY

Tarun George

The authors give their heartfelt thanks to Dr. OP Agarwal, CEO of WRI India and Madhav Pai, Executive Director of WRI India Ross Center for Sustainable Cities for their timely review of the paper. They are also indebted to external reviewers — Gerald Ollivier, Lead Transport Specialist-India, World Bank; Dr. Anup Bandivadekar, Program Director, and Nibedita Dash, Research Consultant, International Council for Clean Transportation (ICCT); Abhay Srivastava, Business Development Advisor, Shell Foundation. The authors are grateful to Dr. Shahana Chattaraj for her guidance in developing the concept brief for this paper. They would also like to thank Dr. Parveen Kumar, Shyamasis Das and Neha Yadav from WRI India for their inputs to the paper. In addition, the authors also thank Garima Jain, Manasi Nandakumar, Rama Thoopal, Dnyanada Deshpande, Uma Asher, Neeraja Dhorde and Karthikeyan Hemalatha who led the copy-editing, design and production of this paper. The findings and suggestions in the paper are the sole responsibility of the authors.

ABOUT THE AUTHORS

Chaitanya Kanuri is Manager-Electric Mobility at WRI India. She has 10 years of experience in the urban development and transport sectors. She leads research and government engagement on the EV charging ecosystem, as well as on innovation and entrepreneurship in electric mobility. She has an MS in Urban Policy and Governance from Sciences Po, Paris.
Contact: chaitanya.kanuri@wri.org.

Rohan Rao is Manager-Electric Mobility at WRI India. He works on analyzing the evolution of EV ecosystem in India and formulating policies for it through data analytics. He is interested in utilizing spatial tools and a data-driven approach in improving cities' transportation infrastructure and promoting equitable communities. Rohan holds a master's in Urban Planning from New York University with a specialization in Urban Transport and Data Science.
Contact: rohan.rao@wri.org.

Pawan Mulukutla is Director-Electric Mobility at WRI India. Pawan leads the overall strategy, implementation and partnerships to accelerate electric mobility by supporting the government at both the national and state level in India. He also guides technical and policy research on electric mobility. He holds a degree in Advanced Management Program from IIM-Bengaluru and an MS in Transport Engineering and Planning from Clemson University, South Carolina, USA.
Contact: pawan.mulukutla@wri.org.