Electric car charging infrastructure future

To learn more about the future of EV charging infrastructure, McKinsey"s Tony Hansen and Florian N?gele spoke with Frank M?hlon, president of the e-mobility division of ABB, and Giovanni Palazzo, president and CEO of Electrify America.

Frank M?hlon: If we are to meet the target of 290 million charging points by 2040, we"ll need $500 billion in public-private investment.3Jonathan Eckart and Frank Muehlon, "Here"s how electric vehicles can keep us on the road to Paris," World Economic Forum, September 11, 2020, weforum . These investments will likely be focused on high-impact segments--those that travel the most and carry large numbers of passengers or objects, such as commercial vehicles and public transport, as well as those that operate in highly dense environments.

Another priority is sustainability. To achieve global targets for emissions reductions as set out in the Paris Agreement, we need clear global standards for EVs, as well as credible solutions to abate emissions across the whole industry. Again, this can"t be achieved in silos but requires public-private joint efforts to create a sustainable EV market.

Overcoming obstacles to expanding EV infrastructure will involve offering financial incentives and regulatory support to drive the transition from internal combustion engine (ICE) vehicles to EVs, including by favoring efficiencies through shared and autonomous EV rides.

Public charging has a significant real-estate component. Charging should be conveniently located both on major interstates and in dense urban areas. Real estate also relates to power availability, especially for fast charging. A location could be great from a utilization perspective, but if there is no electrical-grid capacity, installation could be challenging regardless of the solutions and technology leveraged.

The final obstacle is talent. We have great people working at Electrify America--and, indeed, across EV-charging infrastructure. As the market grows, however, it will require additional talent that is determined to solve complex technological, operational, and consumer-acceptance challenges.

McKinsey: How do dynamics differ in the public-charging sector across the European Union (the Nordic countries and Central, Eastern, Southern, and Western Europe) and the United States?

While at present the United States trails the European Union in prevalence of charging infrastructure, its investor-owned model means the pressure is higher to achieve profitability faster. This push for faster profitability has created a culture among US charging companies of strong operational cost control and more experimentation with different business models.

McKinsey: What are your mid- and long-term views on how the charging-infrastructure sector is changing (for

example, the role of software and services, new business models, consolidation, and competition)?

New software solutions are also emerging that are shaping the future of the sector. One cloud-based digital solution aims to optimize the real-time fleet management of EVs and to speed up the electrification of transport fleets by helping operators maintain 100 percent business continuity as they make the transition to being fully electric.

Studies have found that limited public charging and long charging times are now among the top barriers to further EV adoption. We"ve made progress, though: ten years ago, drivers of electric vehicles could usually charge only at home; then came public Level 2 chargers; and now we are starting to see widespread availability of fast-charging options. But there"s still a lot more growth needed.

More dynamic systems will need to be developed in the medium to long term. Today, time-of-use tariffs for EV charging are emerging from utilities. As renewables on the grid increase, energy supply could fluctuate over the course of a day or a year. A more dynamic system could create value, requiring advances in smart energy and grid services and real-time pricing.

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