With the Biden administration taking office in the United States, electric vehicles and climate change are back in focus as a US federal government priority. Electric vehicles (EVs) are a significant piece to alleviate the climate change issue and supporting a change in fleet composition to EVs has been signaled as a priority for the Biden administration through a Day One executive order pledging 500,000 new charging stations by 2030 and to take the federal government’s vehicle fleet electric going forward, wherever possible. While 80% or more of EV charging occurs in the home or at work, expansion of EV ownership beyond those dwelling in single-family homes, and to reduce range anxiety for trips longer than a normal commute, investment in charging infrastructure will be required. This maxim is true globally, not just in the US.

As one component of Stratas AIM (Automotive Interactive Model) and the Global Automotive Service, Stratas Advisors monitors and forecasts the global EV charging environment through our proprietary EV infrastructure database. China has a substantial lead in terms of current infrastructure development, while other nations grow their charging sites in smaller numbers. That said, the total number of chargers available is only one part of the equation to successful lessening of consumers’ issues regarding access to public charging and range anxiety. The ratio of EVs in the fleet to the number of charging stations (as the number of plugs available, not the number of sites) proves to be a key factor in sustained consumer adoption. Too few will make it difficult for consumers to charge away from their single-family homes; too many will be wasteful spending, particularly if it is government subsidized, if the EV fleet does not continue grow. There is some support for the logic that having a low ratio of EVs to chargers early in the adoption curve can spur on continued switching into electrified vehicles, as the consumer sees available charging spots open for use, whereas if the consumer only saw occupied charging spots, they may think that public spots will never be available when they need to top off the vehicle.
A good target ratio of EVs to charging spots in a country that is experiencing sustainable growth of its electrified fleet is between 15 and 25 EVs for each charging spot. This number allows for the majority of charging to occur at home while providing the flexibility needed for apartment dwellers, as well as those on the go beyond normal commuting, to power up their batteries. Globally, the ratio is expected to climb from a lower ratio to 16.01 by 2035, stabilizing in the 2030s as EV adoption grows to match initial infrastructure builds. By 2035, China is expected to have over 6.5 million charging spots to match a ratio of 12.63 vehicles per charger. Of the major nations highlighted here, the US and Germany are expected to have higher ratios than the global average, though the US is expected to be vastly higher (47.48 EVs per charger in 2035). Many in the United States have single-family homes, which may help to limit the detrimental effects of a higher ratio.

The push-pull effect of EVs entering the fleet and the needed infrastructure to match is an on-going dynamic that is expected to continue as vehicle fleets around the world become electrified in efforts to limit emissions. Many nations are increasing investment in both electric vehicle adoption and the charging infrastructure to match in the coming years as part of their COVID-19 recovery packages. Sustained fleet transitions to EVs will need both sides of the equation to stay in sync.

Stratas Advisors utilized Stratas AIM (Automotive Interactive Model) to determine the effects of EV infrastructure on
electrified fleet growth. Stratas AIM leverages historical data, macroeconomic inputs, fuel costs, and governmental policy, as well as our proprietary EV infrastructure database, to forecast new registrations and fleet size for four vehicle categories (light-duty vehicles, medium-duty vehicles, heavy-duty vehicles, and two-wheelers). New registration and fleet composition are also forecast across 11 powertrains. Each input variable is customizable for such a scenario analysis. For more information and a demo, please reach out to Chris Brown, manager of the Global Automotive practice.

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