The California vehicle emissions program also includes requirements for manufacturers to produce and deliver for sale zero-emission vehicles ("ZEVs"). California's light-duty vehicle ZEV regulation, which uses a system based on credits that can be banked and carried forward, mandates annual increases in the production and sale of battery-electric, fuel cell, and plug-in hybrid vehicles. For 2025 model year, this regulation will require approximately 22% of a manufacturer's California light-duty vehicle sales volume be ZEVs. In August 2022, California approved a sweeping revision to the ZEV regulation. Beginning with the 2026 model year, the revised ZEV rule mandates a 35% ZEV sales requirement, rising to 100% by 2035. The revised regulation also imposes significant restrictions on credit usage, and new requirements for EV battery durability. California has also instituted ZEV regulations governing medium- and heavy-duty vehicles, beginning with the 2024 model year. These stringent ZEV requirements covering light-, medium-, and heavy-duty vehicles could entail significant costs and compliance challenges, and include complex warranty and recall requirements. Compliance with ZEV rules depends on market conditions (including the pace of adoption of EVs), technology readiness, and battery raw material availability as well as the availability of adequate infrastructure to support vehicle charging.

European Requirements. European Union ("EU") and U.K. regulations, directives, and related legislation limit the amount of regulated pollutants that may be emitted by new motor vehicles and engines sold in the EU and the United Kingdom. Regulatory stringency has increased significantly with the application of Stage VI emission standards (first introduced in 2014) and the implementation of a laboratory test cycle for CO_2 and emissions and the introduction of on-road emission testing using portable emission analyzers (Real Driving Emission or "RDE"). These on-road emission tests are in addition to the laboratory-based tests (first introduced in 2017). The divergence between the regulatory limit that is tested in laboratory conditions and the allowed values measured in RDE tests will ultimately be reduced to zero as the regulatory demands increase. In addition, new requirements for tailpipe and non-tailpipe emissions will be included in the upcoming Euro 7 regulation, and the lead-time for engineering and type approval may potentially be too short. The costs associated with complying with all of these requirements are significant, and following the EU Commission's indication of its intent to accelerate emissions rules in its road map publication "EU Green Deal" as well as the EU sustainable mobility action plan, these challenges will continue in European markets, including the United Kingdom. In addition, the Whole Vehicle Type Approval ("WVTA") regulation has been updated to increase the stringency of in-market surveillance. Moreover, following the U.K.'s withdrawal from the European Union, we may be subject to diverging requirements in our European markets, which could increase vehicle complexity and duties.

There is an increasing trend of city access restrictions for internal combustion engine powered vehicles. The access rules being introduced are developed by individual cities based on their specific concerns, resulting in rapid deployment of access rules that differ greatly among cities. The speed of implementation of access rules may directly influence customer vehicle residual values and choice of next purchase. In an effort to support the Paris Accord, some countries are adopting yearly increases in CO_2 taxes, where such a system is in place, and publishing dates by when internal combustion powered vehicles may no longer be registered, e.g., Norway in 2025 and the United Kingdom and the Netherlands in 2030.

Other National Requirements. Many countries, in an effort to address air quality and climate change concerns, are adopting previous versions of European or United Nations Economic Commission for Europe ("UN-ECE") mobile source emission regulations. Some countries have adopted more advanced regulations based on the most recent version of European or U.S. regulations. For example, the China Stage VI light-duty vehicle emission standards, based on European Stage VI emission standards for light-duty vehicles, U.S. evaporative and refueling emissions standards, and CARB OBD II requirements, incorporate two levels of stringency for tailpipe emissions. Under the level one (VI(a)) standard, which is currently in place nationwide in China, the emissions limits are comparable to the EU Stage VI limits, except for carbon monoxide, which is 30% lower than the EU Stage VI limit. The more stringent level two (VI(b)) standard's emissions limits are approximately 30-50% lower than the EU Stage VI limits, depending on the pollutant. While level two (VI(b)) is not slated for nationwide implementation until July 2023, the government has encouraged the more economically developed cities and provinces to pull ahead implementation. For example, Beijing, Shanghai, Tianjin, Hebei province, and Guangdong province have all begun implementing level two (VI(b)). Both China Stage VII light-duty vehicle and heavy duty vehicle emission regulations are currently under pre-study, and the Ministry of Ecology and Environment has advised that the Stage VII regulations will have more stringent limits on pollutant emissions and will establish limits for greenhouse gas (primarily CO_2) tailpipe emissions. In South America, most countries are evolving to implement more stringent requirements accepting Europe and U.S. regulations, except Brazil, which has a unique local process called PROCONVE based on U.S. regulations for light-duty vehicles and European regulations for heavy-duty vehicles.