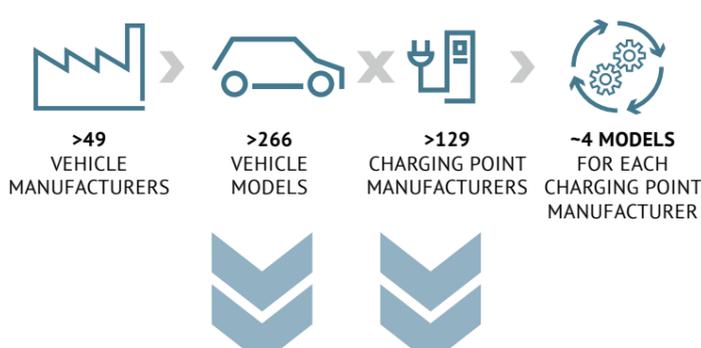


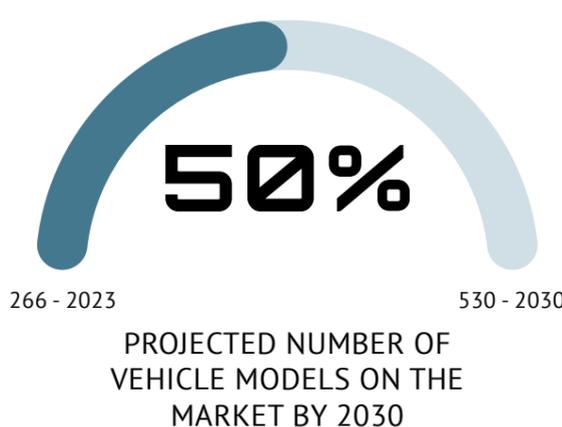
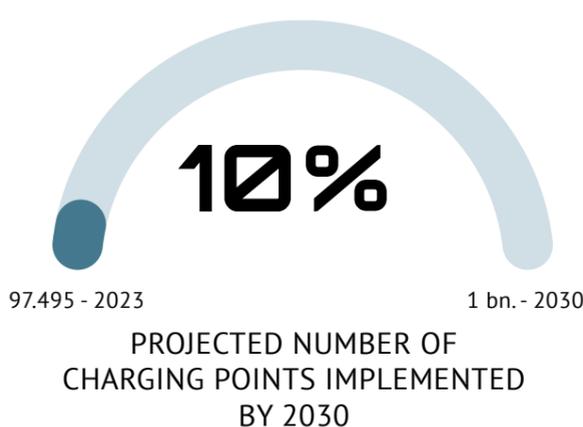
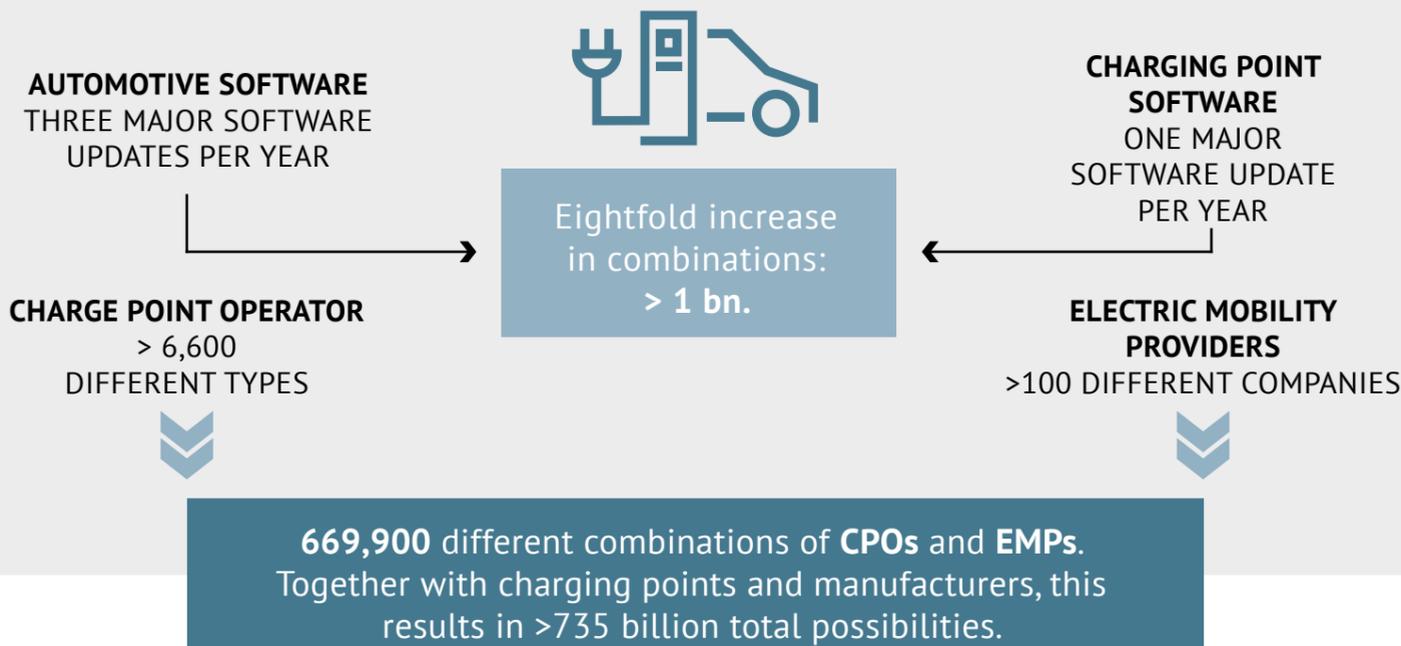
Complexity of the interoperability between the vehicle and the charging point

Innovations in the field of electric mobility are resulting in a constantly increasing level of complexity in the interoperability between vehicles and charging stations. The biggest drivers are, on the one hand, the different standards throughout the world for charging points, vehicles, and backend components, as different models and software versions have a significant influence on making systems more complex. On the other hand, the ever-increasing variety of functions within the context of smart charging systems, such as pre-conditioning, time-controlled charging, or charging from surplus photovoltaic power, are having the effect that requirements are also becoming increasingly complex. These conditions represent major challenges for the electric mobility business. For that reason, it is all the more important to create uniform standards and test scenarios to provide a standardized charging process that functions worldwide.



> 137,256
POSSIBILITIES OF INTERACTION
BETWEEN VEHICLE MODELS AND
CHARGING POINTS

The complexity of interoperability is increased by backend systems



Sharp increase in complexity by 2030

Problems of interoperability



DIFFERENT STANDARDS MAY VARY DEPENDING ON THE REGION AND THE MANUFACTURER, WITH THE RESULT, FOR EXAMPLE, THAT DIFFERENT TYPES OF CHARGING CONNECTORS BECOME ESTABLISHED



DIFFERENT CHARGING POWER LEVELS BETWEEN ELECTRIC VEHICLES AND CHARGING POINTS CAN RESULT IN INEFFICIENT CHARGING OR INCOMPATIBILITY



THE USE OF DIFFERENT COMMUNICATION PROTOCOLS, INCORRECT IMPLEMENTATION, COMMUNICATION PROBLEMS, OR INCOMPATIBILITY MAY LEAD TO CHARGING BEING INTERRUPTED



ROAMING PROBLEMS MAY PREVENT THE USE OF CHARGING POINTS DUE TO BILLING PROBLEMS



FIRMWARE AND SOFTWARE INCOMPATIBILITY MAY RESULT IN CHARGING POINT PROBLEMS IF THEY HAVE NOT BEEN PROPERLY HARMONIZED



THE LACK OF STANDARDIZATION OR UNIFORM INDUSTRY STANDARDS WORLDWIDE WILL MAKE THE INTEGRATION AND USE OF ELECTRIC VEHICLES AND CHARGING POINTS MUCH MORE DIFFICULT