I have a great granddaughter named Gisele who is 2 and 1/2 years old. Long before she is my age she will be traveling long distances by fast electric trains, mainly powered by renewable energy. Her shorter-distance travel of up to a few hundred miles will be by biofueled-hybrid-electric buses and her personal electric car. Scarce biofuels will be reserved for public transportation such as buses, trucks and airplanes.

How will Gisele charge her 200+-miles-range electric car? She will have a fast charging station in her garage or parking space, which will be programmed to charge her car most of the time in early-morning low-demand hours at a very-low cost per kWh, but she will be able to use the station to charge at other times as necessary. There will be fast charging stations in public parking lots and garages where she can charge her car while shopping, dining and being entertained.

When Gisele drives her car out of her region she will, when needed, pull into a battery-changing station to exchange the leased car battery will a fully-charged one in a few minutes time, in less time than it now takes to fill a car with smelly and dangerous gasoline.

Gisele may choose to have her electric car be part of the national vehicle-to-grid program to mostly charge it during low-demand
hours at low cost and often provide storage for the grid at a high cost during high-demand hours, thus making her a profit of several thousand dollars per year.

What you have heard in this TED talk is a very important part of the electric-car future.