Charging stations for electric vehicles

- In the near future, millions of electric vehicles will be on the streets. A suitable charging infrastructure and smart power distribution networks must be built to supply these vehicles with electricity.

- Charging stations are designed to be suitable for installation in various areas, for example, parking lots and buildings. Siemens is developing charging systems that address a variety of different requirements. In addition to controlling the charging process, there are also issues to be resolved, including provision of an IT link between charging stations, integration in smart grids, and integration in billing systems.

- Public and home charging stations have standard sockets used to automatically make the power and data contacts for the charging process. In AC charging, the vehicle battery is charged at voltages of 230 or 400 volts and capacities between 3.7 and 44 kilowatts. A charging session typically thus lasts between 30 minutes and several hours, depending on the battery. The charging stations are energized only when a car is connected and the connection is actually enabled.

- Siemens is developing different solutions for the charging process depending on the application. When a vehicle is connected to a public AC charge point, the contract data will be checked and the maximum possible charging capacity will be indicated to the driver via an RFID card. The charging process starts automatically, and billing takes place in the background via the existing mobility contract. If drivers wish to pay directly on site, they identify themselves at the charge point, for example, via RFID. The charging process starts once approval has been verified, and billing can then take place on site at the payment terminal of the charge point. Additional information can be shown on the charge point’s VGA display, such as city information, tourist destinations, hotels, and restaurants in the vicinity.

- Together with other companies, Siemens is moving ahead with the international standardization of charging plugs, signaling, and communication. The plugs specified in a preliminary standard not only have a charging capacity of maximum 44 kW, but also have connections for signaling purposes. The charge point will recognize, for example, that
an electric car is ready for charging. Conversely, the charge point
directly indicates to the driver what power output it can provide for charging (IEC
61851 mode 3). In addition to making the charging process faster, this
method activates the basic electrical protective measures that eliminate
the dangers that would result from simple "charging at the outlet."

Siemens is also conducting field trials to actively test the interaction of all
electromobility components with one another and in connection with
drivers' behavior. These tests, conducted under real-life conditions,
provide new insights into the suitability of Siemens solutions and the
demands that will emerge in day-to-day nationwide use. That's why
Siemens is both relying on in-house pilot projects and actively
participating in projects with local utilities and other companies. With its
comprehensive approach, Siemens considers itself an all-around pioneer
in electromobility.