

# Electric Vehicle Charging

## Smart Cities - EV Charging

Cities face numerous challenges with regards to energy supply for their citizens and the economy. On the one hand, decentralized energy generation is becoming more and more important; on the other hand, more and more electrical energy is required, especially because of the increasing e-mobility and electric heating / cooling supply. The International Energy Agency (IEA) report 2019 states "... electricity is one of the few energy sources that sees growing consumption in 2040 – mainly due to electric vehicles – ..."

This brings challenges for energy network management peaks in the production of renewable energies must be absorbed, while at the same time covering short-term increasing demands, like electric charging and transportation, must not lead to blackouts.

## The Solution

Siemens ADVANTA Solutions provides a solution based on the MindSphere City Graph that provides applications & professional services to improve forecasting of charging demand and clear understanding of the impact on infrastructure.

This allows the network provider to better plan its network expansion and does not have to consider large extra capacity increases. Consequently, the grid will be more resilient despite increasing demand, and citizens will benefit from getting their car charged in an optimal cascade of energy tariffs, time and system costs.

This is made possible by graph-based digital twin technology: MindSphere City Graph, which allows a simplified data modeling, data ingestion, streaming analytics, contextualization and semantification, as well as business process modeling and analysis.

## Benefits

- Increase the attractiveness of e-charging for all stakeholders (citizens, network operators, energy supplies)
- Improve energy load balancing
- Contribute to a sustainable infrastructure in a resilient city.
- Efficient planning and utilization of electrical network.

## Features

- Smart City ontology design
- AI/ML based algorithms for prediction of digital twin states
- Electricity network data and topology
- Electrical load information of transformers and charging points
- Static map data
- Transportation information and traffic flows
- Utilization of additional relevant data like weather and open government data.

