



EV Charging Infrastructure Course: Site Design, Grid Connection and Smart Charging



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Introduction:

EV charging infrastructure, covering site design, grid connection and smart charging, is a 5-day course for utility, real estate, fleet, municipal and fuel retail engineering and planning teams that ends with a Charging Site Design and Business Case for a case location. Organisations install chargers in the wrong places, oversize grid connections or leave expensive DC units idle and out of service because demand, power and revenue were never modelled together. Nominees already plan, specify or run electrical or property assets and build a working site model across the week. CoreConcept Training Center delivers this EV charging infrastructure course.

Course Objectives:

- Explain how battery, onboard charger and charging curve characteristics set the power and dwell time a charging site must serve
- Specify AC and DC charge points, connector systems and charging modes under IEC 61851 for parking, depot, forecourt and kerbside sites
- Forecast charging demand and rank candidate locations by traffic, dwell time, land access and available network capacity
- Size the number and rating of charge points, the site transformer and the grid connection using diversity and load management assumptions
- Configure OCPP back-office control, ISO 15118 communication, smart charging profiles and payment options for a public or private site
- Build a charging site business case with tariffs, utilisation ramp, capital and operating costs, and uptime targets for operations and maintenance

Target Audience:

- Utility connection and network teams that assess and approve new charging loads on low and medium voltage networks
 - Real estate and facilities teams that add charging to car parks, residential towers, offices and retail destinations
 - Fleet engineering teams that plan depot charging for vans, buses, trucks and pool cars
 - Municipal planning and transport teams that select kerbside and public car park charging locations
 - Fuel retail network teams that convert forecourts into fast and high-power charging hubs
 - Electrical design and site operations teams that specify, install, commission and maintain charge points
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Course Outline:

Day 1: Electric Vehicle Technology and Charging Landscape for Planners

- Battery Pack Capacity, State of Charge and Charging Curves
- Onboard Charger Limits for Single and Three Phase AC
- Charging Use Cases at Home, Workplace, Depot and Corridor
- EVSE Terminology, Charge Point and Charging Station Hierarchy
- Current-State Charger Inventory and Utilisation Baseline Template

Day 2: Charging Levels, Connector Systems and Communication Protocols

- IEC 61851 Charging Modes and Control Pilot Signalling
- Type 2, CCS and CHAdeMO Connector Selection by Vehicle Mix
- DC Fast and High-Power Charger Architecture and Cooling
- OCPP Messages Between Charge Point and Management System
- ISO 15118 Plug and Charge and OCPI Roaming Agreements

Day 3: Demand Forecasting, Site Selection and Charging Site Sizing

- Charging Demand Model From Traffic, Dwell Time and Adoption
- Candidate Location Scoring Matrix With Land and Power Criteria
- Charge Point Count and Rating From Arrival Profiles
- Site Layout of Bays, Cable Routes, Accessibility and Signage
- Site Transformer, Switchboard and Grid Connection Capacity Sizing

Day 4: Grid Impact, Smart Charging, Safety and Operations

- Peak Load, Voltage Drop and Harmonic Checks at Connection
- Static and Dynamic Load Management With Smart Charging Profiles
- Vehicle-to-Grid Bidirectional Charging, Peak Shaving and Battery Limits
- Earthing Arrangements, Residual Current Protection and Fault Isolation Checks
- Uptime KPIs, Remote Diagnostics and Preventive Maintenance Routines

Day 5: Modelling Build: Charging Site Design and Business Case

- Case Location Demand Forecast and Charger Mix Selection
 - Grid Connection Option Comparison With Load Management Savings
 - Tariff Design, Payment Methods and Revenue Model Assumptions
 - Capital Cost, Operating Cost and Utilisation Ramp Cash Flow
 - Charging Site Design and Business Case Completion and Defence
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Skills You Will Gain:

- Charging Demand Forecasting
- Charge Point Specification
- Charging Site Sizing
- Grid Connection Assessment
- Smart Charging Configuration
- Charging Protocol Integration
- Charging Business Case Modelling
- Charger Uptime Management

Why Attend This Course:

- Deliver a Charging Site Design and Business Case for a case location to the investment committee and the network connection team
- Choose between AC and DC chargers, connection capacities and load management settings using demand and cost evidence
- Avoid stranded chargers, oversized connection charges and long outages that erode charging revenue and user trust
- Share demand models, siting matrices, sizing sheets and uptime checklists with planning, electrical and operations colleagues

Conclusion:

Back at work, the participant gives the investment committee and the network connection team a Charging Site Design and Business Case that sets the charger mix, the connection capacity, the load management approach, the tariff and the expected payback. Management uses it to approve the site, request the grid connection and select an operating model, while operations teams use its uptime targets to set maintenance contracts. After the first months of operation, the unit should compare real utilisation, peak demand, revenue and charger availability with the model and adjust the next site.

Frequently Asked Questions FAQ:

What should participants know before an EV charging infrastructure course on site design and smart charging?

Participants should understand basic electrical quantities such as kilowatts, kilowatt-hours and voltage levels and work on property, network, fleet or forecourt assets. Bringing traffic counts, a site plan or an electricity bill for a candidate location helps them apply the modelling build to their own site.

How does an EV charging infrastructure course differ from a distribution network planning or fleet management course?

It concentrates on the charging site itself: chargers, connectors, protocols, site sizing, connection, load management, tariffs and uptime. Network planning courses study whole feeders and substations over many years, and fleet courses cover vehicle acquisition, maintenance and running costs across the vehicle life cycle.

Why does EV charging infrastructure planning use smart charging and load management?

Smart charging shares the available connection capacity between vehicles according to dwell time and priority. It lets a site serve more vehicles without a larger grid connection, reduces peak demand charges and gives the network operator a controllable load instead of an unmanaged peak.

What do participants take back from the EV charging infrastructure course?

Participants take back a Charging Site Design and Business Case for a case location, with a demand forecast, siting matrix, charger and connection sizing sheet, load management settings, tariff model and uptime KPI set that they can adapt to their own sites.
