



# Energy Bootcamp Courses

Online Learning by SEPA

## Electrification of Transportation Fundamentals

3-Part Course | 7 Hours

August 8, 9, and 10, 2023, from 2:00 - 4:30 PM Eastern

On-Demand Available August 24, 2023

### Session 1: Growth of EVs, Technology Issues, and Customer Concerns

- Setting the stage—the rise of electric vehicles.
  - Historic adoption rates.
  - Projected future growth and models.
  - Passenger vehicles.
  - Fleets and buses.
- Critical issues related to customer adoption.
  - Charging speeds—Level 1, Level 2, and Level 3 DC fast charging.
  - Charging standards and interoperability—ChadeMo, CCS, Tesla, wireless, and battery swapping.
- Vehicle limitations and concerns.
  - Charging speeds.
  - Battery capacity and technologies.
  - Battery chemistries, cycle lives, and implications for the grid.

## Session 2: Implications of EVs for future power grids

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- Implications for load growth and energy consumption—high voltage system.
  - Projected future energy use.
  - Resource adequacy.
- Challenges at the low voltage circuit level.
  - Hosting capability and need for potential infrastructure investments.
- Cybersecurity.
  - Potential impacts to vehicles and grid.
  - Countermeasures.
- Approaches to grid connections.
  - Managed charging.
  - Wireless charging combined with storage.
  - Vehicle-to-facility.
  - Vehicle-to-grid.

## Session 3: Policies and Planning Models for an Optimized EV Future

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- Addressing the mobility of the resource and registration of unique, mobile assets.
- Aggregation.
  - Communication and coordination with assets from multiple vendors.
  - Remote monitoring of stationary vehicles, assessing cycle life, and state of readiness.
  - Dispatch and portfolio management—vendor vs. utility control.
- Assigning value to EVs in a distributed energy resources (DER) planning process.
  - The challenge of forecasting at macro and granular levels.
  - Understanding potential evolution in-vehicle use and charging behavior.
  - Valuing the resource and setting appropriate incentive levels to achieve desired outcomes.
  - Understanding limitations and creating portfolio approaches.
- The critical importance of incorporating EV management into multiple utility planning departments (“silos”).
  - Understanding the potential, limitations, and impacts on multiple departments (e.g., generation, transmission, distribution, IT, and customer care).
  - The challenge of coordination among multiple entities (grid operator, distribution utility, vendor).
- Effective EV program design,
  - Setting appropriate rates,
  - Motivating participation in DER programs (drivers, charging companies, and other potential actors),
  - Effective program design with pricing and technology,
  - Iterative technology evaluation for targeted outcomes.
  - Integration with other distributed energy resource programs.
  - Addressing the critical need for timely, accurate, and granular market-based locational information.
- Policy and rate structures.
  - The importance of the policy and regulatory landscape.
  - Federal policy drivers (e.g., FERC 2222).
  - EV tax incentives and other subsidies.
  - State and local policy drivers (monetary incentives and other privileges).
- The growing need for an evolving and secure grid architecture.
  - The challenge of growing bi-direction flows/transactive power.
  - Monitoring and power quality concerns.

### Questions?

Contact [learning@sepapower.org](mailto:learning@sepapower.org)

