SCE's TE Technical Projects: Service Center of the Future

ACT EV Charging Workshop:
Advanced Energy Management with Storage, Solar, and Microgrids

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Energy for What's Ahead®

SOUTHERN CALIFORNIA EDISON®

Southern California Edison and Pathway 2045

- 50,000 square-mile service area
- 5 million customer accounts
- 15 million residents
- Infrastructure
  - 1.4 million poles
  - 700,000 transformers
  - 103,000 miles of T&D lines
- Pathway 2045 (100% of retail sales carbon free)
  - 40% increase in peak load
  - 80 GW of new generation
  - 30 GW of new energy storage needed
  - 75% of vehicles electric
  - 70% of buildings electric
  - Two thirds of medium-duty trucks
  - One-third of heavy-duty trucks

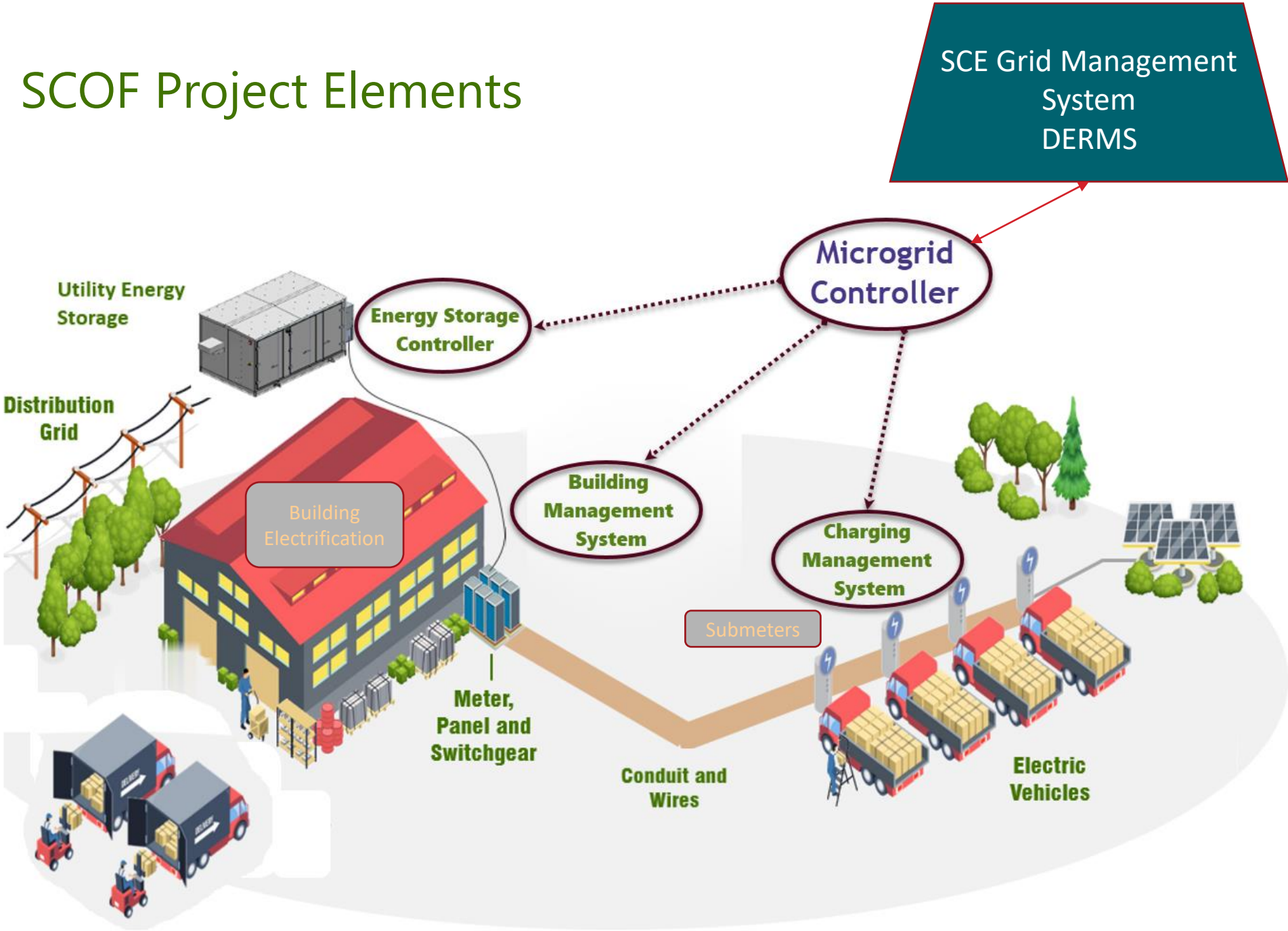
Service Center of the Future EPIC Demonstration

- EPIC – Electric Program Investment Charge: Ratepayer funded RD&D program
  - R&D portion managed by California Energy Commission
  - Demonstration portion managed by state's IOUs, such as SCE
  - 21 projects in various stages of planning and execution
  - 3 Transportation Electrification projects, including SCOF

- Original focus on SCE fleet, 50 electric service centers distributed over 50,000 square mile service area

- Support goal to electrify SCE's fleet of 6000 vehicles as efficiently as possible
  - Equip service center with elements to reliably fuel fleet vehicles at lowest cost and impact, incorporating controls and DERs
  - Utilize the service center and its controls to support the local grid and integrate local DERs

SCOF Project Elements



Objectives and Use Cases

Demand Response

- Microgrid control system (MCS) to communicate and manage demand response (DR) events
- Building management system (BMS) to optimize building energy usage
- Charging management system (CMS) to contain EV peak demand

Grid Support

- MCS to support over/under voltage conditions using ESS and controls
- MCS to charge/discharge ESS to support grid capacity needs

Resiliency

- MCS to manage island formations
- MCS to manage grid re-synchronization

EV Charging Management

- CMS to optimize EV charging schedule, satisfying requirements of fleet operation while minimizing electric fuel cost

Delivering Value

- Demonstrate alternative service option and real/controlled capacity needs
- Integration of fleet operational control strategy with site and grid energy management systems
- Interconnection of ESIP storage system and battery management functions (grid side, customer side, generation, distribution)
- Siting of storage and infrastructure components on customer property and consideration of operational needs, configuration, switching
- Outage resiliency of bus charging with energy storage
- Demonstrate advanced metering options and back office systems
- Learnings to enable further deployment of such technology and lower the cost and time required for large-scale fleet electrification