

An EV Future: Resilience and Reliability

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California Public
Utilities Commission

Discussion Overview

- California state policy context
- CPUC policy context
- CPUC activities

State Policy Context and Overview of Successes and Challenges

California's Legislature and Governor center EVs' resilience and reliability benefits



Multiple bills have highlighted the importance of EVs and grid benefits:

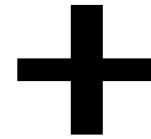
AB 2127 (Ting, 2018), SB 676 (Bradford, 2019), AB 841 (Ting, 2020)



California Zero-Emission Vehicle Market Development Strategy

1. **Equity in every decision**
2. **California embraces all zero-emissions pathways**
3. **Collective problem-solving**
4. **Public actions drive greater private investment to scale investable markets**
5. **Design for resilience and adaptation** – We are developing the ZEV system holistically, with resilience and adaptation front of mind. ZEVs enable opportunities to stabilize and support our energy system for the benefit of all, including increasing reliability, resilience, and renewable energy penetration

Collective problem solving



- **Local and Regional Government**
 - Air Districts
 - City/County Government
 - Metropolitan Planning Organizations
 - Regional Transportation Planning Agencies
- **Federal and Tribal Governments**
 - Federal Government Agencies and National Labs
 - Tribal Governments
- **Vehicle Manufacturers and Supply Chain**
 - Dealerships (and dealership groups; direct sales)
 - Light-Duty Manufacturers
 - Medium- and Heavy-Duty Manufacturers
 - New Market Entrants
 - Off-Road Vehicles and Equipment Manufacturers
 - Suppliers
- **Grid Operators, Electricity, and Hydrogen Providers**
 - Balancing Authorities
 - Community Choice Aggregators
 - Electric Utilities, Load-Serving Entities
 - Electric Vehicle Charging Station Providers and Installers
 - Gas Utilities
 - Hydrogen Producers
 - Hydrogen Station Developers and Operators
 - Registered Service Agencies
- **Fleets (public and private)**
- **Non-Governmental Organizations**
 - Codes and Standards Bodies
 - Collaboratives
 - Community-Based NGOs
 - Environmental NGOs
 - Equity NGOs
 - Trade Associations
- **Investors/Financing Institutions**
- **Organized Labor**
- **Academia**
 - Community Colleges
 - Universities
- **International Relationships**

EVs + Resilience/Reliability at the CPUC

We're making progress, but work remains

- ✓ Opening **interconnection** pathways for EVs
- ✓ IOUs offer EV-specific **rates** to encourage off-peak charging
- ✓ Required IOUs to report on and accelerate **VGI for resilience**
- ✓ Allocated **funding** to EV-based resilience projects
- ✓ Allow EVs to participate in **emergency reliability program** (pending)

- ⚠ Establishing **compensation** for energy / capacity / ancillary services
- ⚠ Technical **standards** to fully enable bi-directionality and networking
- ⚠ **Bidirectional capability** in existing/future vehicle fleet
- ⚠ Fully integrated EV **infrastructure planning process** at the CPUC

Multi-pronged approach to deploying EVs with Reliability and Resilience as a priority



Planning

- Integrated Resource Planning
- Distribution System Planning
- TE Infrastructure Planning



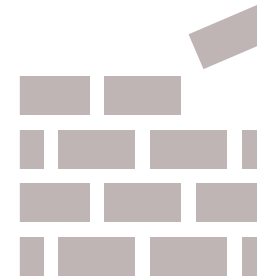
Technical Standards

- Interconnection (AC, DC, Microgrids)
- Submetering
- Networking and Communications
- Microgrids and Resiliency Proceeding



Financial Incentives

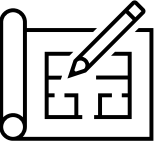
- TOU Rates
- Distribution Deferrals
- Dynamic Rates (Pilot / TBD)
- Grid Services (TBD)



Pilots and Programs

- Emergency Load Reduction Pilots
- LCFS funding for resiliency
- New VGI Pilots (TBD)

Examples: Policy Planning + Pilots



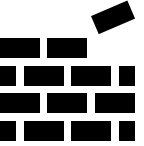
Transportation Electrification Framework (TEF) Prioritizes Near-Term Resilience Projects

Resilience projects are identified as “near term priorities” for the IOUs to invest in over the next few years. The four key strategies ID’d include:

1. **Customer Communication** – EV-focused communications pre/during events; reducing on-peak penalties for emergency charging
2. **Backup Power Resources** – Exploring V2B and other backup solutions
3. **Availability of Public Charging** – Ensuring charging is available for pre-event charging and for those who have evacuated during an event (potentially off-grid)
4. **Damage to Utility TE Infrastructure** – plans for restoring TE infrastructure damaged by a disaster

Emergency Load Reduction Program

(Proposed Program)



- **Purpose: additional load reduction during times of high grid stress and emergencies involving inadequate market resources**
 - Avoid uncontrolled rotating outages while minimizing cost to ratepayers
- **5-year pilot. Program available May-Oct, 7 days / week, 4-9 PM**
- **Triggered by IOUs to address forecasted grid reliability concerns**
- **After the fact, pay-for-performance for voluntary reduction of energy consumption**
 - No “capacity-like payments,” [energy payments only]
 - No penalties for non- or under-performance
 - Eligible to electric vehicles with a minimum 25kW export threshold



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