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California – World leader in E-Mobility

How to use ZEVs to enhance energy resilience

July 15th, 2020
California was first to mandate the catalytic converter in 1981

Leading up to 1981 the car manufacturer said:

- Too expensive
- Adds weight
- Adds volume
- Lowers gas mileage

But they went along
California was first to adopt the Zero Emission Vehicle (ZEV) in 1990

The purpose of the ZEV program was to meet California’s health-based air quality standards and greenhouse gas emission reduction goals and move the cars away from petroleum-based fuel.

Today approximately 750,000 EV, PHEV on the road in California

2030 goal: 5 million ZEVs in California
California first to introduce the Energy Resilient Vehicle (ERV)?

ERVs provide resilient mobile power when and where it is needed in disasters through export of energy from their batteries.

Bi-directional EV
1. Cars sold in California must contribute to reduce air pollution and greenhouse gases

2. Electric Vehicles (EV) could provide emergency power (technology is already available)

3. Why should EV technology not help California to provide resilience in case of natural disasters or Public Safety Power Shutoffs (PSPS)?
California Governor Declares Statewide Emergency Over Wildfires

Gavin Newsom announced an "emergency in advance of an emergency" in hopes avoiding a repeat of 2018's record-breaking fire season.

By Sarah Ruiz-Grossman

California Gov. Gavin Newsom on Friday declared a statewide emergency to immediately begin wildfire prevention efforts across the state.

The announcement, made in Northern California's Lake County, follows one of the worst fire seasons in state history. Newsom said his executive order was "a proclamation that declares an emergency in advance of an emergency."
Oct. 2019 - One million PG&E customers to lose power
Oct 10, 2019 - Public Safety Power Shutoff (PSPS) - The New Normal?
A Day in the Life of California

Customers affected by the PG&E PSPS

The Mercury News

PG&E begins power restoration after mass shutoffs across Bay Area
600,000 customers still without power

Oakland police officers in a police cruiser stay alert in the Montclair shopping district during the PG&E power outage in Oakland, Calif., on Thursday, Oct. 10, 2019. (Ray Chavez/Bay Area News Group)

*Map updated as of 7:45 p.m. 10/9/19
Lessons learned from Japan’s Earthquake/Tsunami (9.1 magnitude)

March 11, 2011

- 20,000 people dead
- 138,000 buildings destroyed
- Millions of people without power
- $360 billion costs

This experience lead to:

- Nissan and MMC developing bi-directional EV/PHEVs for energy resilience in case of natural disasters
- Vehicle-to-Home applications in Japan
The EVs are already born bi-directional
Acceleration and regenerative breaking
Vehicle-to-Home Technology is already in EVs

Mitsubishi Motor Corporation

Nissan V2H Microgrid
How to incentivize the car manufacturers to adopt ERVs*  
A “CARB analogy” on Zero Emission Vehicles (ZEV)

The California Air Resources Board

The California Air Resources Board (CARB) is charged with protecting the public from the harmful effects of air pollution and developing programs and actions to fight climate change. From requirements for clean cars and fuels to adopting innovative solutions to reduce greenhouse gas emissions, California has pioneered a range of effective approaches that have set the standard for effective air and climate programs for the nation, and the world.

including making communities more energy resilient.

* Bi-directional chargers should be considered also
All the players must come together to help California adopt the Energy Resilient Vehicle

- Regulation
- Car Manufacturers
- Utilities
- Emergency Responders

- Bi-directional EVs
- Ease of micro-gridding
Summary - ERV need to get buy-in from all the players


2. ERVs will mitigate the damage caused from natural disasters by providing emergency backup power and transportation.

3. Currently there are only a few EV* brands that support bi-directional power flow. Nissan and Mitsubishi Motors are the two Japanese OEMs that support it.

4. The automotive OEMs are unlikely to move towards bi-directionality because they are preoccupied with the transition to EV.

5. The California ERV approach should be tied to the car incentive for ZEV.

6. It is important to establish a regulatory framework required for automotive OEMs to justify the business case for EV bi-directionality.

* Bi-directional chargers with emergency power option should also be covered by the initiative.