

DOCKETED	
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California – World leader in E-Mobility

Enhance energy resilience through use of ZEVs

July 15th, 2020

California was first to mandate the Catalytic Converter (1981) and Adopt the Zero Emission Vehicle (ZEV) regulation in 1990

Los Angeles 1975



Los Angeles April 6, 2020



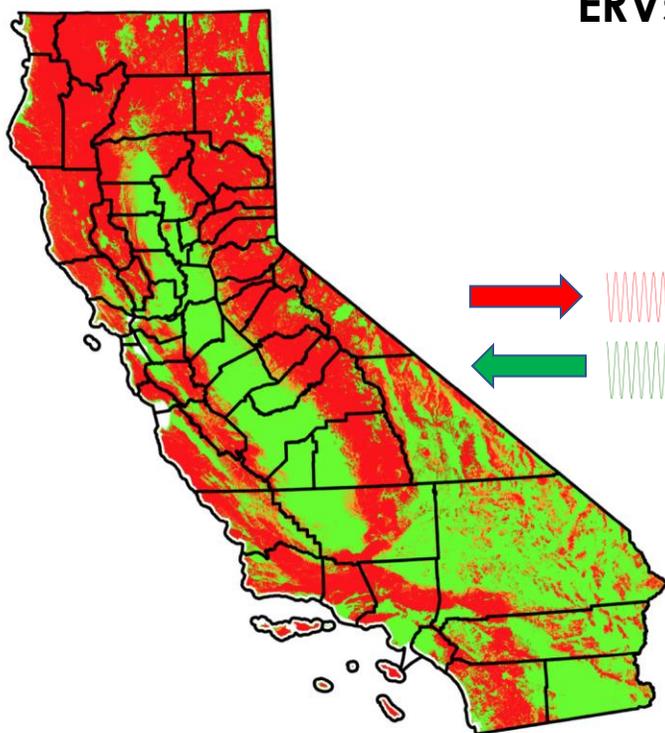
1981



Today 750,000 EV, PHEV on the road in California
2030 goal: 5 million ZEVs in California

Will California be the first to introduce the Energy Resilient Vehicle (ERV) ?

Fire Hazard



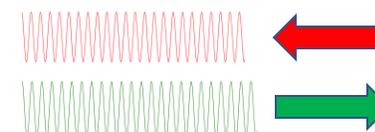
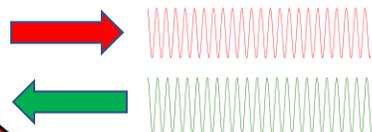
ERVs provide resilient mobile power when and where it is needed in disasters



60 kWh

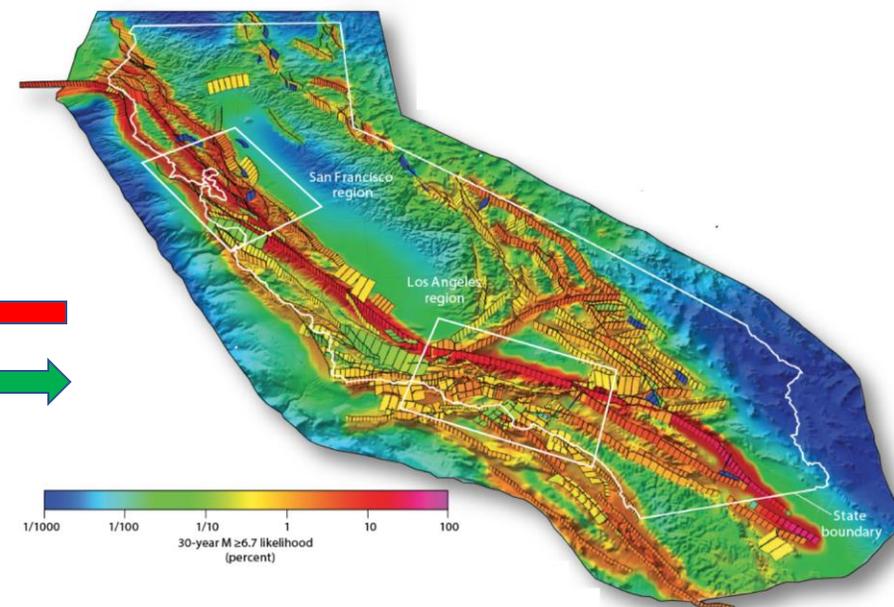


100+ kWh



through export of energy from their batteries

Earthquake Hazard



The ERV Idea

1. Cars sold in California must contribute to reduce air pollution and green house gases
2. Electric Vehicles (EV) could provide emergency power (technology is already available)
3. So why should EV technology not help California to provide energy resilience in case of natural disasters or Public Safety Power Shutoffs (PSPS) for homes, businesses and communities?

Oct 10, 2019 – PSPS The New Normal?

The Mercury News

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

POLITICS 03/22/2019 03:37 pm ET

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.

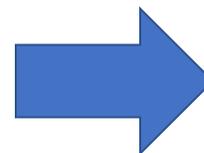
The [announcement](#), made in Northern California's Lake County, follows one of the worst fire seasons in state history. Newsom said his executive order was "a proclamation that declares an emergency in advance of an emergency."



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)

Lessons learned from Japan's Earthquake (9.1) / Tsunami

March 11, 2011



This experience lead to:

- A number of Japanese car OEMs developing bi-directional EV/PHEVs for energy resilience in case of natural disasters
- Vehicle-to-Home applications in Japan

Bi-directional power flow is already in a few inexpensive EVs (and trials with school buses)

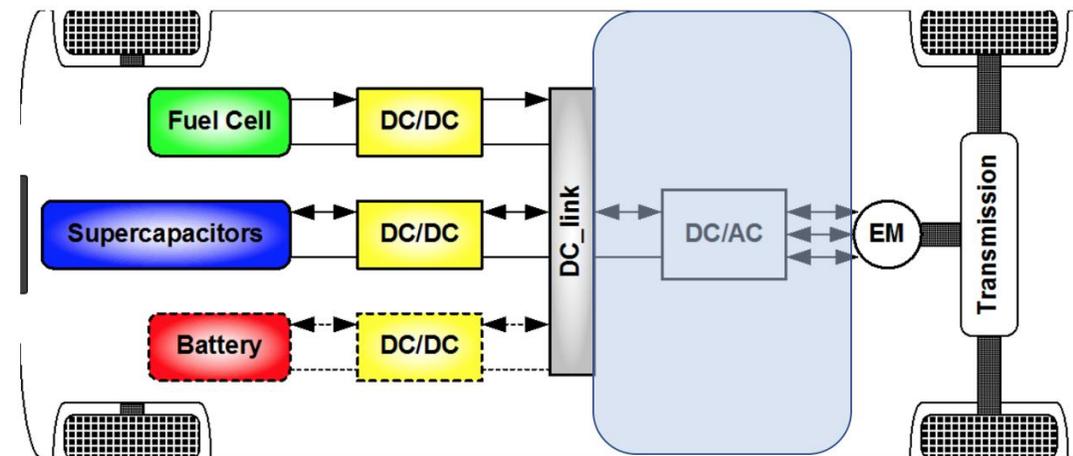
Nissan
V2H Microgrid



School buses bi-directional
Community power



All EVs are already born bi-directional
Acceleration and regenerative braking



How to incentivize the car manufacturers to adopt ERVs*

Use ERV credits in analogy with CARB ZEV credits



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**

What is a zero emission vehicle?

Under the ZEV regulation, three distinct vehicle designs are considered “zero emission,” though to varying degrees.

Plug-in hybrid vehicles combine a conventional gasoline-powered engine with a battery that can be recharged from the electrical grid.

Battery electric vehicles run entirely on electricity and can be recharged from the electricity grid.

Hydrogen fuel cell vehicles run on electricity produced from a fuel cell using hydrogen gas.

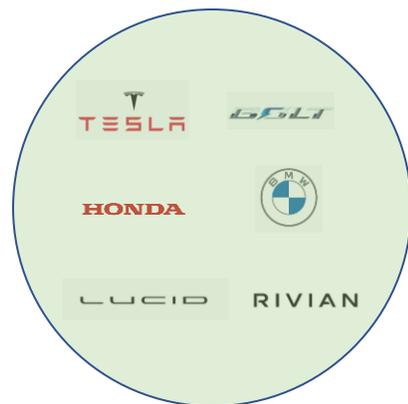
.. Add ERV Energy Resilient Vehicle

What is an Energy Resilient Vehicle?

Under the ERV regulation distinct vehicle designs are considered “energy resilient” if the vehicle can provide emergency power in case of natural disasters like earthquakes or wildfires or as a result of power cuts to prevent wildfires.

All the players must come together to help California implement the Energy Resilient Vehicle Regulation

Car Manufacturers



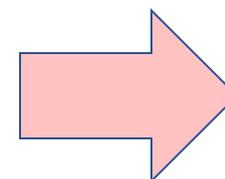
Regulation



Utilities



Emergency Responders



- Bi-directional EVs/EVSEs
- Clear rules for Interconnection (DC/AC)
- Ease of micro-gridding

Summary

1. California faces dual existential crises: wildfires and earthquakes and we must all help.
2. ERVs will mitigate the damage caused from natural disasters by providing emergency backup power and transportation.
3. Currently there are only a few Japanese EV brands that support bi-directional power flow.
4. The automotive OEMs are unlikely to move soon towards bi-directionality because they are preoccupied with the transition to EVs.
5. The California ERV approach should be tied to the credit incentive for ZEVs.
6. It is important to establish a policy framework required for automotive OEMs to justify the business case for EV/EVSE bi-directionality.