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SPAN

Vehicle-to-Home: SPAN Approach

CEC V2H Webinar



Who is SPAN

OUR MISSION

Enable electrification for all, and energy management for every home.

Founded 2018 · San Francisco

THE PROBLEM: THE GRID to HOME BOTTLENECK

48M — 48 million+ U.S. single-family homes may need a panel upgrade to fully electrify

600K+ — CA homes likely to need a service upgrade in the next decade

$6K–$40K — typical cost of a traditional service upgrade, which can take months



Our Solution

The Panel

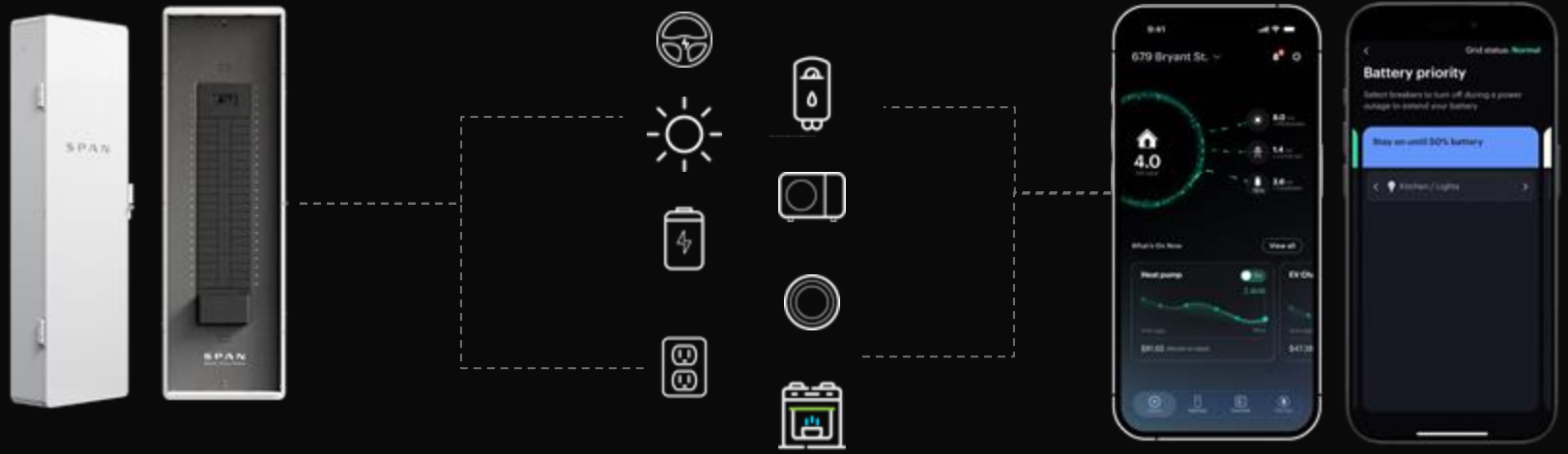
A smart 1:1 replacement for the traditional electrical panel - the ubiquitous home electrical infrastructure

Whole Home Control

Revenue-grade metering, visibility and on-device or digital control of every individual circuit in the home.

The Platform

Control and monitoring for SPAN products through a single SPAN Home App interface



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The SPAN V2H Approach

The EV powers the home - SPAN manages the whole home's energy

The best whole-home backup experience
Islands the home during an outage, enables vehicle to power the home, while actively managing loads

Never proprietary
SPAN leans into open standards, allowing homeowners to choose the right products for their home

One app, broad reach
Solar, home battery, EV, and appliances managed together in the SPAN Home app

Maximizes Homeowner control
Get outage notifications and prioritize what stays on with SPAN PowerUp

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Why the panel is the control point for V2H

01 Circuit Control by Design

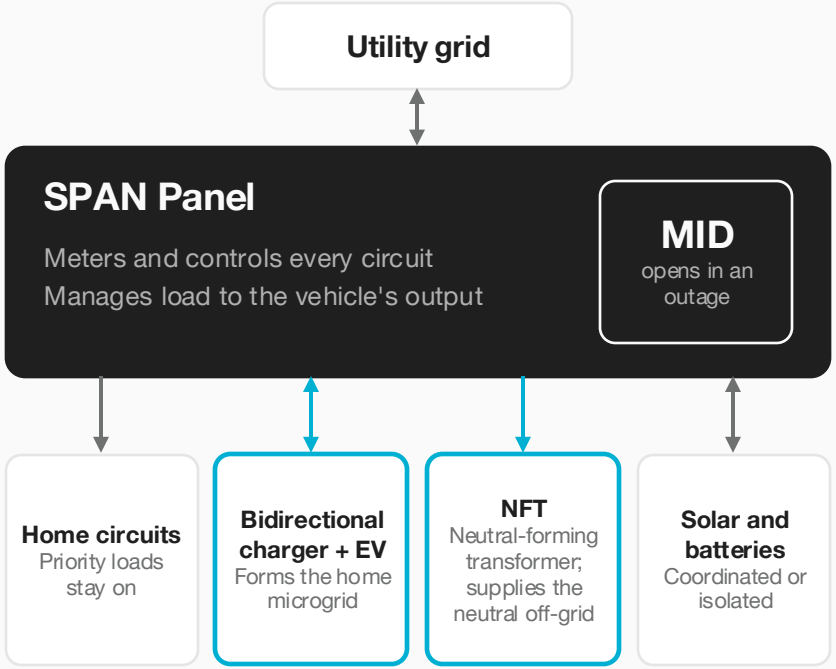
Every branch circuit is metered and switchable, so the home runs on what the vehicle can supply. Simplifies the amount of boxes on the wall

02 Integrated MID

SPAN Panel's microgrid interconnect device isolates the home from the grid in an outage and reconnects it safely when power returns.

03 3141 PCS Enabled

SPAN PowerUp actively manages power within the system to keep the home under its service rating both on & off-grid



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Our first V2H system, built with a Top EV OEM

15+ kW

backup power from the vehicle to the whole home w/ integrated active load shedding

SYSTEM COMPONENTS:

- SPAN Panel with SPAN MID
- Bidirectional AC charger
- SPAN neutral-forming transformer
- SPAN Home app control experience

EXTENDED GRID OUTAGE PROTECTION

01

Isolate

SPAN detects the outage, opens the MID, and switches off solar and oversized loads.

02

Form the grid

The charger forms the home's microgrid after a self-check of about 90 seconds.

03

Discharge

The homeowner starts discharge in the vehicle app. SPAN keeps load within vehicle limits.

04

Return

Once grid power is stable, SPAN stops V2H and reconnects the home automatically.

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What will accelerate V2H

Barriers

- **Certification**: No standardized pathway for system certifications and testing across various system components and configurations.
- **Cost**: a bidirectional charger, MID, and electrical work add up additional installed cost. Export and resiliency economics must create value beyond costs.
- **Custom integrations:** each automaker and equipment pairing is bespoke work between system components.

Interoperability

- **Comms Standards:** The MID and the EV are the interoperability critical paths. Open MID standards and open EV standards can crack open the market.
- **Economics:**: Market adoption requires incentivizing innovation and hardware development in addition to solving the delivery of pricing signals through protocols like OpenADR.

Priority actions for the CEC

Drive Standards: Reference open standards in flexible demand and program rules as opposed to closing on one protocol per device.

Seed the Market: Expand pilot funding of V2H and extend into use cases where load management across the whole home is combined with controlled charging.

Leverage PCS: Recognize and incentivize power control systems (PCS) integration into V2H that generate both grid and customer value through flexible service connections and avoid service upgrade costs.

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THE TAKEAWAY

The EV is the biggest battery at the home.

SPAN makes it a seamless part of the home.

Open standards enable the highest value to consumers, OEMs, and the grid