EV Program Best Practices and Insights

Achieving Scale Through Customer-Centric Program Design

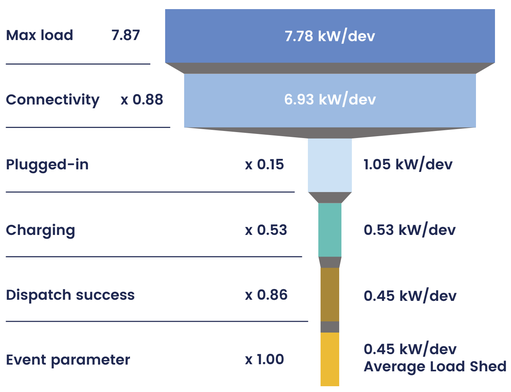
SRP | EnergyHub

Salt River Project (SRP) is committed to adding 500,000 electric vehicles (EVs) in its territory and 90% of those to flexibility programs by 2035. SRP partnered with EnergyHub to explore how SRP can meet customers' diverse changing needs while managing system impacts.

Pilot's first year provides a solid program foundation

- EV Pilot program (250 participants) evaluating load shed events through EVSEs
- Two EVSE OEM partners: ChargePoint & Enel-X Way (level-2 chargers only)
- 37 utility events were completed between June 1th- Oct. 31st 2022
- Targeted deployment strategy based on EVSE OEM, time, and day-of-week
- Load shed was 18% higher than those observed in other EnergyHub EV programs
- EnergyHub-developed engineered baseline methodology for estimating load shed on a small fleet, via deterministic device-level counterfactual energy consumption during the peak/post-peak hours

EV Charger Load Shed Funnel



The Load Shed Funnel combines and layers key parameters to visualize how event load shed results may be lower than expected, given the high loads typically associated with EV charging

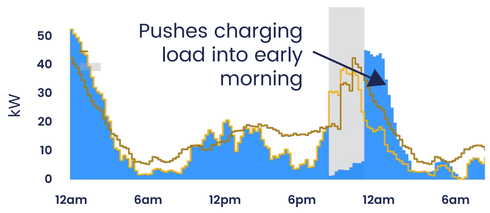
Target	Result
Run at least 1 event/week beginning in June 2022	Events run at least 3 weeks/mo June-Sept.

- Learn EV charging behaviors
- Vary event timing and duration
- Understand event load reduction levels
- Charging aligns with price plan incentives
- 37 events run YTD across 9 start times
- 68% higher load shed in later evening events

2022 Pilot Demand Response (DR) Results

Price plans impact DR load shed

Overnight event provides 0.95 kw/device



Actual kW/h — Engineered baseline — ISO-NE baseline — Event time (6-10pm)

- SRP customer price plans heavily impacted EV DR load shed results
  - Customers largely align their EV charging with rate plan off-peak & super off-peak hours
  - Peak load reduction window for events was observed after 7 p.m.
- Weekday events had higher load shed results in evening hours
- Common early-evening peak hours have low % of EVs plugged-in and charging
- The EH engineered baseline showed more consistent and reliable results compared to the ISO averaged baseline for this this participant group

Interpretations and Implications of the 2022 Results

- Participant rate plan heavily influences charging behavior
  - **EV & EV-export** (11 p.m.-5 a.m. super off-peak) plan customers made up **nearly 40%** of the participation group and provided no load shed during early-evening events
- Choice of price plan and utility-driven events result in corresponding load spikes/surges
  - These behaviors, while intended, may present other issues on the grid in the future
- Common early-evening peak hours have low % of EVs plugged-in and charging
  - The value of managed charging is significantly impacted by these behaviors and the time of day a grid service is requested
- Customer participation and satisfaction was high
  - Low opt-out rates and enrollment targets met relatively quickly

2023 New Strategies for the EV Flex Charge Program

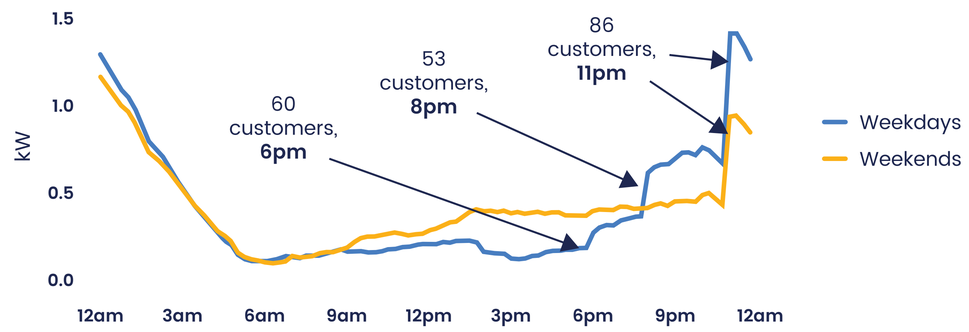
Using EV DR for more than just evening peak mitigation

- **Surge reduction/ smoothing**
- **Demand response refinement**
- **Thermostat DR snapback reduction**
- **Customer fatigue**
- **Energy cost reduction**
- **Asset-aware dispatch**

Desired outcomes:

- Utilize EVSE controls to complement customer price plans and behaviors via **surge smoothing** and **demand response refinement** techniques
- Increase value to the grid via **extending life of distribution assets** and **reducing energy costs** while **avoiding fatiguing customers**
- Leverage EVSE controls to **compliment/offset the impacts of other DERs** on the grid (e.g. **thermostat snapback** following SRP BYOT events)

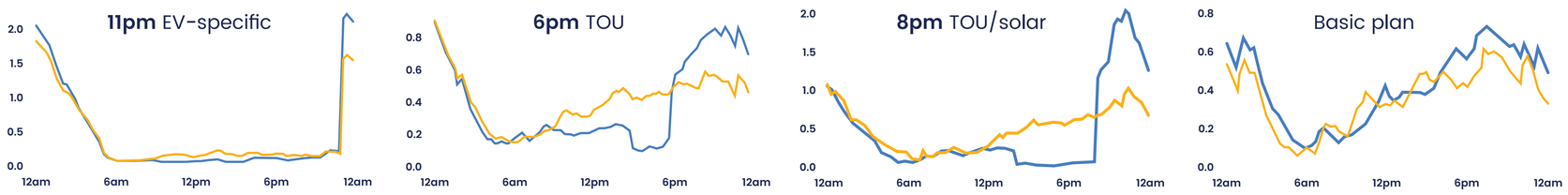
Summer (May-October) Fleet Charging Behavior



SRP customer price plans affect DR impact

Weekdays — Weekends

Summer weekday vs. weekend load grouped by surge hour



Device counts by "surge" hour

	Count	Surge Hr
EV-specific customer rate plans	86	11pm
Other TOU/solar plans	53	8pm
TOU (on-peak 4-7 pm weekdays)	3	7pm
TOU (on-peak 3-6 pm weekdays)	60	6pm
Basic: no change in rates	30	none