



Electric Vehicles and Auto DR

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AutoGrid

EV Charging Landscape

- Best places to charge
 - Currently – Home
 - Wish list – Work, Shopping, Entertainment
- Type of Charging
 - L1 Charging – “Trickle Charge”
 - L2 Charging – “Slow Charge”
 - DC Charging – “Fast Charge”
- Several networks
 - ChargePoint, Blink, NRG eVgo, Greenlots
- Barriers
 - Expensive to install & deploy: No clear ROI
 - Competing Standards (CHAdeMO, SAE, OCPP)



Key Question

Are EV Chargers a
dependable, dispatchable
demand side resource?

SCE EV Charging Pilot Objectives

- Prove technology using open standards
- Run the pilot and collect data on user behavior
- Use data to suggest programs to PUC

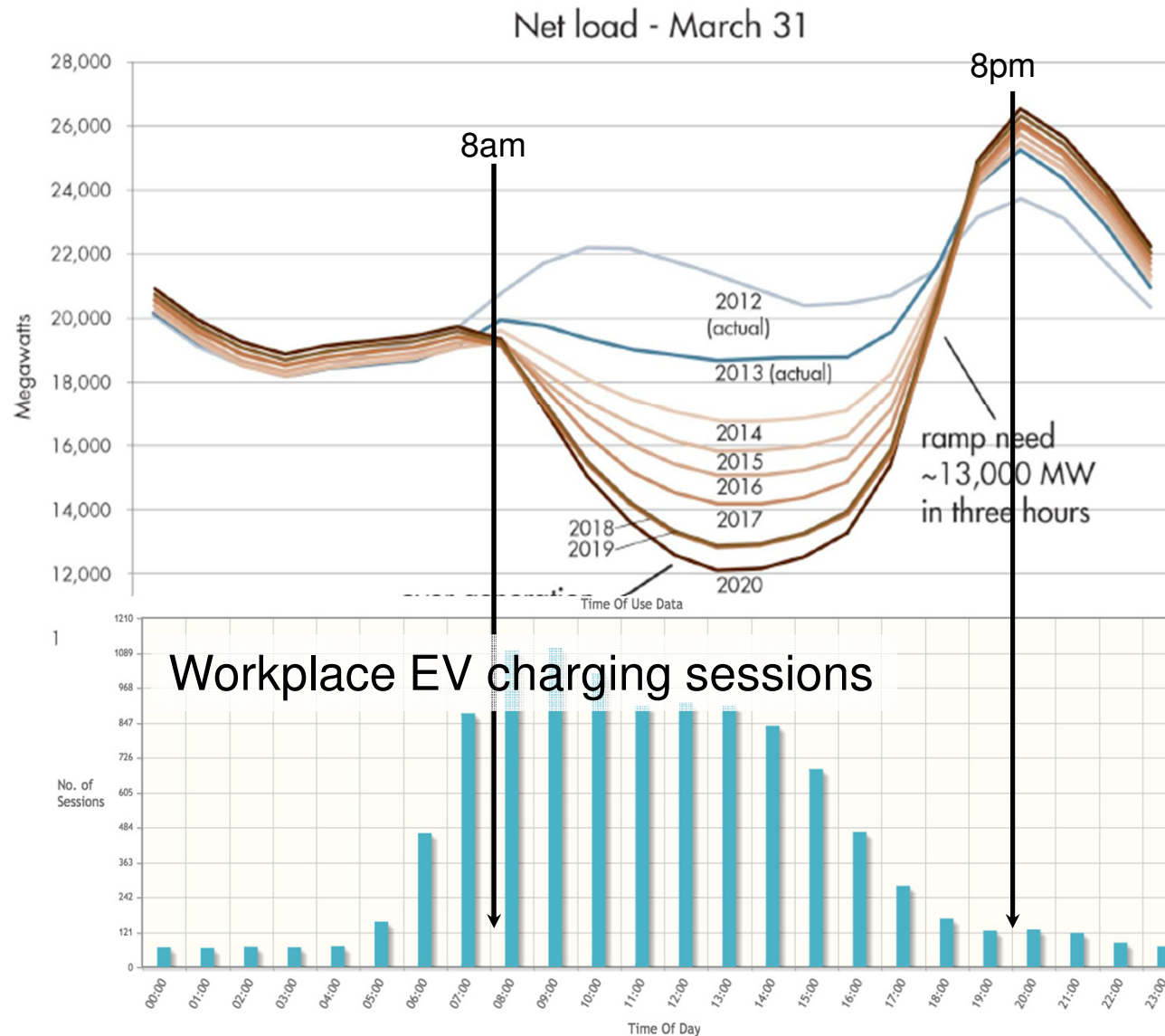
SCE Pilots

- Workplace Charging (OpenADR 2.0b)
 - Greenlots VEN and CMI infrastructure
- Automotive Telematics for EVs (OpenADR 2.0b)
 - Sumitomo VEN
- Ancillary Services (OpenADR 2.0b)
 - Universal Devices VEN
- SEP 2.0
 - Home Charging
 - DER and Flow Reservation

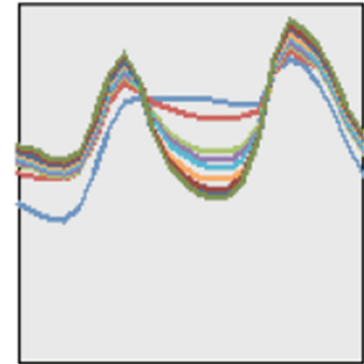
Workplace Pilot

- ▣ TOU Pricing Events
 - ▣ X\$/hr (2 Tiers)
 - ▣ Event Pricing
- ▣ Curtailment Events
 - ▣ Targeted
 - ▣ Emergency
- ▣ Energy Usage Reporting

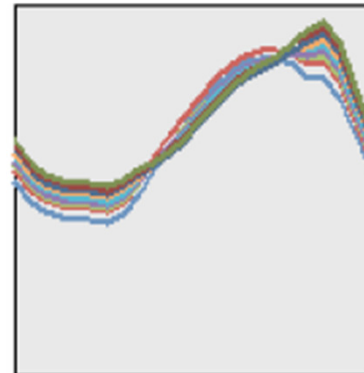
EV Charging at Work Complements the Duck Curve



Winter - January 31st



Summer - August 10th



Conclusions

- As workplace charging becomes more prolific, the aggregated load will become important
- Automated DR-enabled charging is emerging, and can be very favorable to the grid
- Using open standards like OpenADR allow us to focus on program design and implementation, instead of worrying about the communication protocol