

## Energy Efficiency and Demand Management in Planning EV Technologies

Wednesday, June 15, 2016 2:45pm

Matthew Marshall (Redwood Coast Energy Authority)

### **Session Introduction:**

- (Why EVs at a EE conference?) Holistic approach - looking for connections across the board
  - GHG pie - transportation is large chunk
- Upstream emissions for creating electricity for EVs is equivalent to emissions from producing gasoline

### **Topic: Rural, Regional Public Infrastructure Deployment - Redwood Case Study**

- First step: determine locations of infrastructure demand
  - Research trips to create model of most effective location
    - Fast charging along corridors
  - Need to be considerate of typical locations and where an emergency location might be
    - ex Big Foot Museum far out from town not used often but could be needed in dire situations
- Next step: Preliminary plan - cost estimate, location, assessment of distribution infrastructure (grid)
  - Rural site - cell reception required for service calls, wireless availability for communication of charging technology
  - Safety - copper theft
  - Older solar panels did not have enough capacity
  - Take away: Many, many updates were required for site to make it ready for charger installation - old solar, no conduit on power lines
- Considerations:
  - Charging can be significant impact on site host - one charging event causes huge spike in utility use, if during peak time could be really bad for site host and they pull plug on project
  - In rural areas, willing site hosts are few and far between - must be careful to select sites and take steps to not burden site host
    - Need to make every site count (limited real estate)
  - Redwood Coast Energy Authority owns and operates charging network to relieve some burden from hosts
  - Separate meters when possible to easily track energy use of station
  - Really difficult to get people out of cars in rural areas, so PEV are the best plan for GHG reductions in transportation sector

Raef Porter (Climate and Energy Team Manager, Sacramento Area COG)

### **Topic: Take Charge Program - EV readiness in Sacramento Region**

- Sacramento Municipal Utility District (SMUD) assisted in getting program off ground (but was not able to help outside of Sacramento county in neighboring areas outside of jurisdiction)
- Research demographics on who are PEV drivers
  - Helps determine best locations for charging stations
- Reducing distance between charging sites relieves “range-anxiety” for drivers
  - Land use planning
- Research found that public places had the most potential for EV charging station locations, more so than at home or at work
  - Highly visible, increase awareness
- Project Take Charge - worked with SMUD to build charging stations at grocery stores
  - Chargers will be a captive audience for the business
  - Also looking into building charger at Amtrak station
- Lessons learned
  - Lots of pushback from property owners despite charger install being 100% free and any pre upgrades required also paid for

Rick Teebay (Fleet & Transportation Specialist, LA County)

### **Topic: EVSE & DVFC Chargers - Dos and Don'ts and What's Next**

- Dos:
  - Have a champion, have a plan
  - Install conduit/raceways when: repaving a parking lot, putting up a parking structure and/or installing solar in a parking lot (Will be required in revised Title 24)
    - Easy way to go about EV-readiness
  - Know all costs and how to pay for them, keep pricing affordable, know about demand chargers and how to avoid them especially with DC fast charge
    - Demand chargers: Increase charge time but limit electricity demand
  - Learn about Low Carbon Fuel Credits (LCFCs)
  - Put an L2 charger on meter with highest demand so that the charger does not really cause a usage spike, but “blends in” with existing usage pattern
  - Know what's coming and how to position your agency
    - Longer range cars coming to market - affects charging location selection
    - ADA requirements
  - Keep in mind disadvantages communities and multi-family housing - where are they going to charge?
- Don'ts:
  - Think short term

- Blindly choose a vendor thinking they're all the same, you could get locked into a bad one in the long run
- What's next?
  - ADA requirements begin Jan 1, 2017
  - New title 24 will require pre-wire
  - New CARB requirements will increase sales of EVs

Joseph Oldham (San Joaquin Valley Clean Transportation Center) did not come.

## Q&A

- What percentage of EVs can handle a DC charge right now?
  - No exact data, but most do not. New battery technology in 2017 will allow for fast-charge capabilities.
- How are your programs funded to build charging stations?
  - Sacramento: Grant from CEC, Federal Highways allow NPOs to use federal dollars for charging (Grants). Cost recovery - no profit from chargers but just break even (charge for kWh of charge)
  - Redwood: CEC Grants. Pricing is sustainable, affordable, but enough to recover install costs.
  - LA: IOUs have to replace transformers due to EVs. IOUs *need* electrification of transportation due to renewables and energy efficiency lowering demand.
- How to avoid demand spikes/demand charges?
  - Blend into load when demand is already high; time charging to avoid double ups of peak usage/spikes. Low demand buildings should use separate meter.
  - Storage and solar can help reduce spikes - "Peak shaving"
  - Holistic approach - storage might be used in other applications down the road, maybe even allow you to shift down to lower rate.
- What is the projected trend of EVs sales going to look like in the future and how do we plan for how many chargers to deploy?
  - By 2035 everything will be zero emissions. Legacy companies will take a while to phased out. What about poor people? - charging needs to be ubiquitous.
  - Bi-directional flow - sell power back during peak to not interrupt the grid. Going to be a brave new world.
  - Far outpaced initial estimates (Sacramento). Still trying to catch up to EVs on the road right now. Once they actually meet the current demand

(hopefully within 5-10 years) they will have learned a whole lot about EV charging station planning.

- Range will change charging planning. Updating plan on a four year basis and learning each time.
  - Trend is steep but not where it needs to be to meet state goals
- Say there are not many feasible site hosts, what do you know about on-street charging?
    - Portland, OR “electric avenue’ provided a lot of knowledge for this type of project. Biggest concern is how to police station - charging for parking and charging and who is in charge of that?
    - City of Santa Monica is doing a pilot - Montana Ave.
      - Charge-ready program by Edison
      - Be sure to consider multi-family neighborhoods as locations for on-street chargers
    - Redwood has some, but they are connected to a host site.