Clean Coalition

Making Clean Local Energy Accessible Now

Peninsula Advanced Energy Community (PAEC)

Supercharging the buildout of electric vehicle charging infrastructure

Sven Thesen
Dr. Kristin Kuntz-Duriseti

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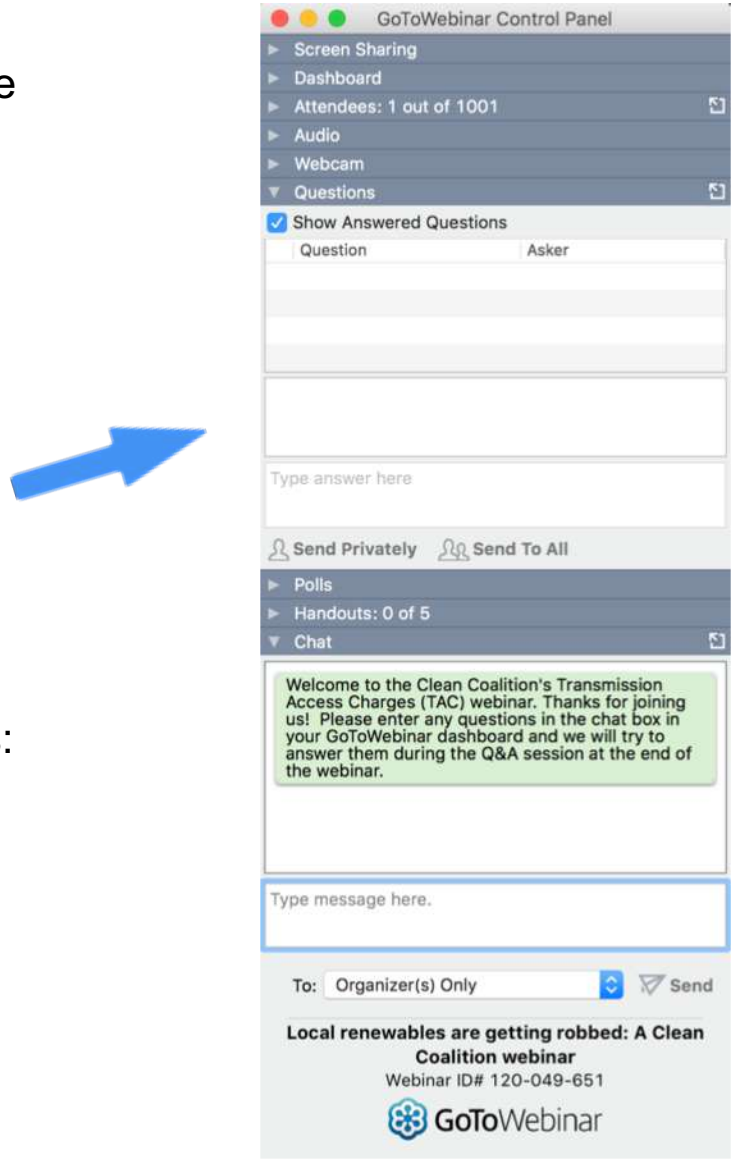

Today's presenters

Sven Thesen

Evangelist for EVs and zero net energy homes who spearheaded Palo Alto's groundbreaking EV infrastructure ordinance.

Dr. Kristin Kuntz-Duriseti

Managing Editor of *Climatic Change*, an international journal publishing interdisciplinary research on the description, causes, and implications of climate change.

Agenda

- PAEC EVCI study
- Accelerating EV adoption: 5 actions for local governments
- Innovative/low-cost EVCI installations
- Proposed EVCI for Redwood City, East Palo Alto, and Palo Alto
- Palo Alto FIT: PV and EV wins!

PAEC EVCI study

Electric vehicle charging infrastructure (EVCI) study goals:

- Confirm/refute: Long-range EVs catalyzing new charging paradigm
- Rate/recommend EV acceleration tools for local governments

PAEC EVCI study

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Electric vehicle charging infrastructure (EVCI) study:

- Online survey, 156+ participants
- Interviewed sustainability managers and EV thought leaders
- EV literature review/pulse

Google's Waymo buys 20,000 electric Jaguar SUVs for driverless luxury taxi service

INSIDEEVs

See Tesla Model S P100D Race Lamborghini Huracan Performante

PAEC EVCI study results

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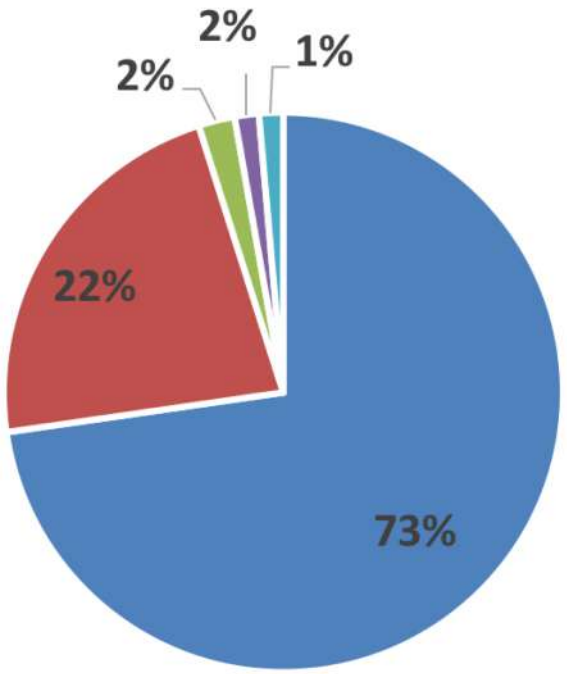
Long-range EVs catalyzing new EVCI paradigm:

- Focus on L1/L2 in residential, workplace + DCFC in public spaces for long-range driving
- Less focus on L2 in public spaces for topping up & commuter EVs

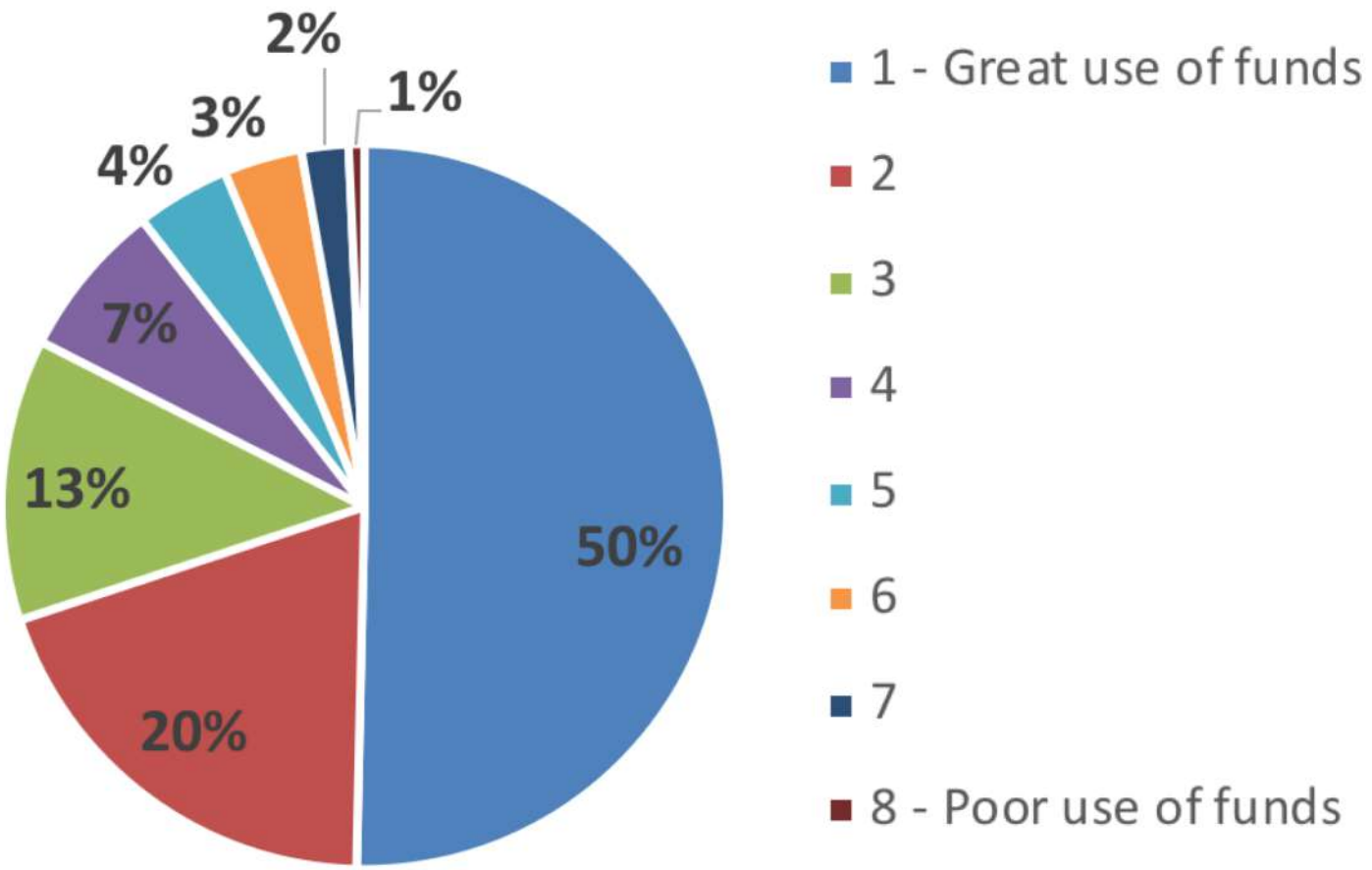
2017 EV Sales	
Model	Sales
Tesla Model S	27,060
Chevy Bolt	23,297
Tesla Model X	21,315
Toyota Prius P	20,936
Chevy Volt	20,349
Nissan Leaf	11,230
Ford Fusion En	9,632
Ford C-Max En	8,140



Residential and workplace charging: Key to EV adoption?

PAEC EVCI study results

#1 action by municipality w/ $25k to accelerate EV adoption: strong residential EVCI code



PAEC recommendations: Accelerating EV adoption

Five prioritized actions for local governments:

1. Strengthen building codes to require EVCI installation for new buildings and renovations, with a density of one charger per residential unit.

Palo Alto Code:

https://www.cityofpaloalto.org/civicax/filebank/documents/43818

SF, Oakland, and Fremont also have solid EVCI codes.

PAEC recommendations: Accelerating EV adoption

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Five prioritized actions for local governments:

2. Encourage public DCFC infrastructure (long-distance travel) with ownership, installation, and operation by third parties

(Electrify America & Tesla)

PAEC recommendations: Accelerating EV adoption

Five prioritized actions for local governments:

3. For residential and workplace (L1 and L2), focus on low-cost installations via grants and utility-funded installs:

- PG&E's Charge Network (covers 80-90%)
- BAAQMD's Charge! Program ($3k/port Q3/4 2018)
- Local Utilities & CCAs (Palo Alto, Sonoma Clean Power)

PAEC recommendations: Accelerating EV adoption

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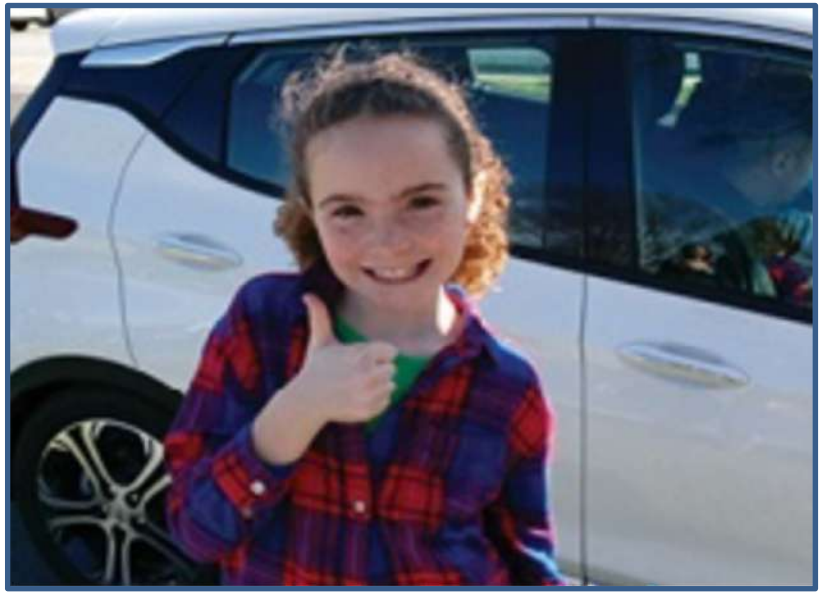
Five prioritized actions for local governments:

4. Public signage for EVCI

PAEC recommendations: Accelerating EV adoption

Five prioritized actions for local governments:

5. Conduct EV ride & drives and related educational activities.



PAEC recommendations: Accelerating EV adoption

Five prioritized actions for local governments.

BONUS sixth action:

6. Pilot codes requiring some level of EVCI for existing multi-unit dwellings and workplaces. (Norway has a code requiring EVCI installations at existing for-pay parking lots)

PAEC: Innovative/low-cost EVCI installations

Intelligent chargers:

- Networked; grid connected automated, variable billing and more
- But: expensive to acquire, operate, and maintain

Non-networked chargers:

- Essentially safety devices
- Inexpensive and *inexpensive*

PAEC: Innovative/low-cost EVCI installations

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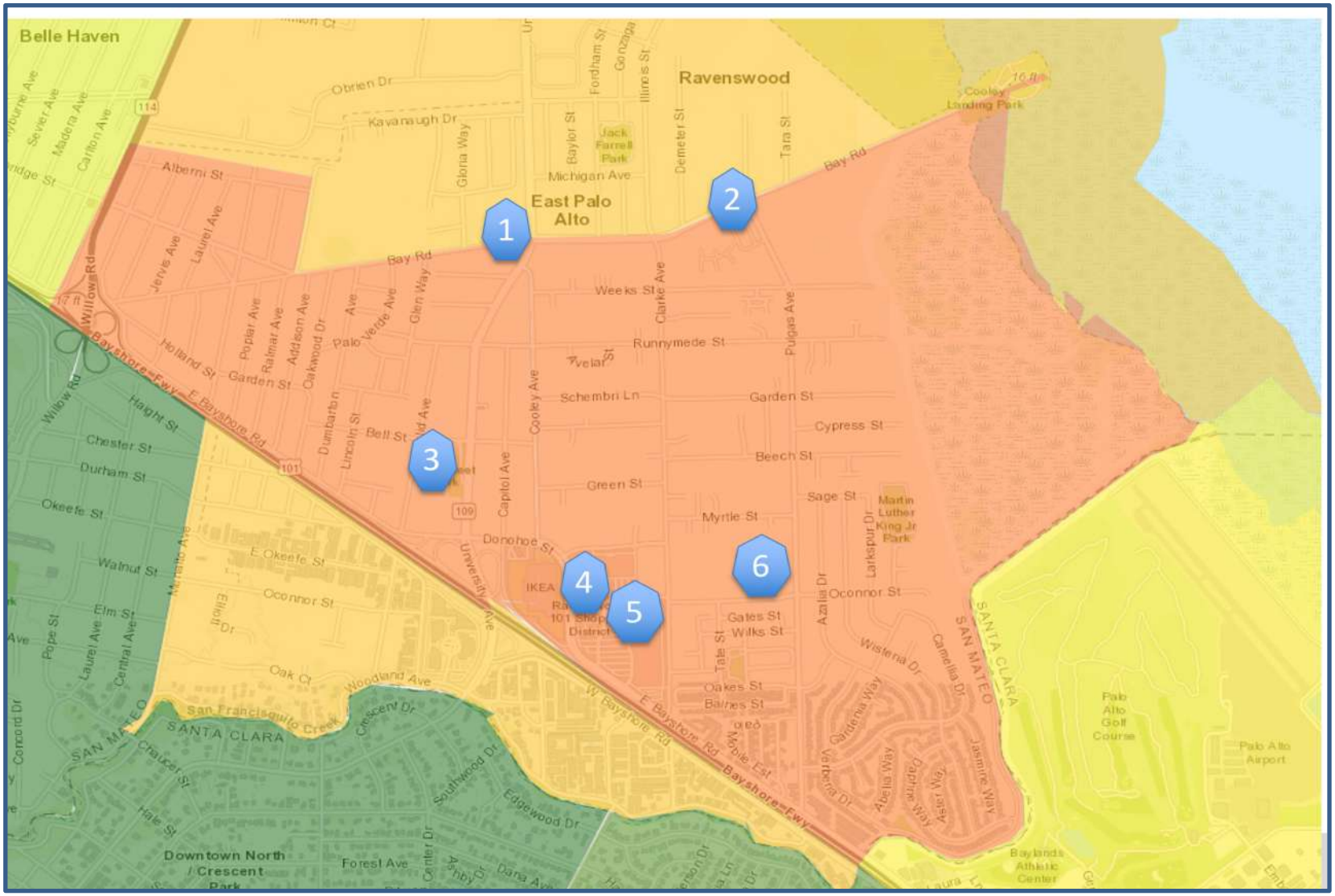
Use existing parking billing systems and inexpensive chargers

PAEC: Potential EVCI for East Palo Alto



PAEC: Potential EVCI for Redwood City

PAEC: Potential EVCI for Palo Alto

Palo Alto has proposed to expand their public downtown (University Ave corridor):

1. Bryant Street Garage – 5 dual-head chargers
2. Webster Street Garage – 7 dual-head chargers
3. City Hall Garage – 8 dual-head chargers

Palo Alto FIT: PV and EV wins!

Source: www.cityofpaloalto.org/electricvehicle

Palo Alto FIT: PV and EV wins!

What is a Feed-in-Tariff (FIT)?

- A FIT is a negotiated contract to allow the sale of excess energy
- A FIT is an ideal model for high-capacity, low-demand PV sites
- A FIT solves the problem with Net Energy Metering

Palo Alto FIT: PV and EV wins!

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Palo Alto solar canopy on parking structures

- 2013 FIT: Palo Alto CLEAN
  (Clean Local Energy Accessible Now)
- 2014 RFP for solar siting leasing rights
- 2016 PPA for 25-year fixed fee (tiered)
- Nominal annual lease fee
- EVCI benefit

Palo Alto FIT: PV and EV wins!

Agreement with Komuna Energy

- Install 1.3 MW (1600 kW) of solar PV on 4 city-owned parking garages
- Install 18 charge ports in 3 city-owned parking garages (6 additional ports/ garage)
- Provide electrical infrastructure to support an additional 80 charge ports (EVCI-ready)

Palo Alto FIT: PV and EV wins!

Opening of Bryant Street garage, July 2017

Palo Alto FIT: PV and EV wins!

City of Palo Alto partnership

- BAAQMD grant to install 40 charge ports
- Nearly 100 total public EV charge ports
- Nominal fee (23¢/kWh) to incentivize turnover
- Rebates for EVCI at schools, nonprofits, multi-family and mixed-use properties; funding from Low Carbon Fuel Standard Credit sales

Questions?

For questions and assistance, contact:

Josh Valentine

Communications Manager, Clean Coalition

josh@clean-coalition.org