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Electric School Bus Infrastructure Workshop

Sarah Williams
Advanced Vehicle Technology Office
Fuels and Transportation Division

November 29, 2018

Housekeeping

- In case of emergency
- Facilities
- Sign-in sheet
- WebEx recording

Contact Information

The Energy Commission is collecting contact information for networking purposes in today's workshop.

**If you do not want your information to be publically available, please let us or the WebEx administrator know today.

Agenda

- Welcome
- Program Overview and Background
- Case Study: Twin Rivers Unified School District
- Utilities Assistance
- Infrastructure Development
- General Discussion: Questions and Answers

Senate Bill 110

- Funding: $75 million
- Eligible applicants: school districts, county offices of education (COEs) and transportation joint power authorities (JPAs).
- Priority given to the oldest school buses, school buses operating in disadvantaged communities and to schools that have a majority of students eligible for free or reduced-price meals.
- Any school bus replaced shall be scrapped.

Program Design

Three complementary funding components:

1. School Bus Replacement: to replace the oldest, dirtiest diesel school buses with clean battery electric school buses. (SB 110 Funding)

2. Fueling Infrastructure

3. Workforce Training

Distribution of $75 Million

- Each region has an approximate average daily attendance of 1.5 million.
- Approximately $18.75 M allocated to each region.
- Eligible applicants will compete for funding within each region.

Alternative Renewable Fuel Vehicle Technology (ARFVTP) Program Funding

Electric Infrastructure

- $26 million (ARFVTP Funds) for EV infrastructure.
  - ✓ $60k per awarded school bus.

Compressed Natural Gas (CNG) School Bus Component

- $3.7 million (ARFVTP Funds) for CNG school buses.
  - ✓ $165,000 per school bus.

- $2.4 million (ARFVTP Funds) for CNG infrastructure.
  - ✓ Up to $500k per awardee.

Electric Vehicle School Bus

Region in California	# of Counties scored
North	22
Central	18
Los Angeles	1
South	4

Utilities in California

Utilities with highest ranking applicants:

- Pacific Gas & Electric (87)
- Southern CA Edison (47)
- San Diego Gas & Electric (9)
- Sacramento Municipal Utility District (5)
- Imperial Irrigation District (4)
- Modesto Irrigation District (4)
- Anaheim Public Utilities (3)

Utilities in California *(continued)*

Utilities with highest ranking applicants:

- Anza Electric (1)
- City of Colton (1)
- City of Shasta (1)
- City of Ukiah - Electric (1)
- Calaveras Public Power Agency (CPPA) (1)
- Kenyon Energy (1)
- Liberty Energy (1)
- Liberty Utilities (1)
- Los Angeles Department of Water & Power (1)
- Pacific Power and Light (1)
- Redding Electric (1)
- Sonoma Clean Power (1)

Milestone Targets

Activity	Date
School District Solicitation Release	**May 31, 2018**
Applications Due	**September 20, 2018**
Post Electric Bus List (Initial NOPA) and CNG School Bus List (final NOPA)	**November 2018**
Release Bulk Pricing for Electric Buses Solicitation	December 2018
Business Meeting Approval - CNG School Buses	February 2019
Award Manufacturer(s)/Dealer(s)	April 2019
Award Electric School Buses (Final NOPA)	April 2019
Install Infrastructure	April - December 2019
Begin Delivering Electric School Buses	Estimated: October 2019

Case Study

Tim Shannon

Director of Transportation

Transportation Services

Twin Rivers Unified School District

Timothy.Shannon@twinriversusd.org

Infrastructure in Review

Twin Rivers Unified School District

Tim Shannon
Director Transportation Services

Where to Start

- What are your current needs going to be?
- Are you going to expand your fleet in the future?
- Where is your Fleet going to be located?
- How close is your fleet to your power?
- Do you have adequate power or do you need to upgrade?

Our Path

- We assembled a Team.
- We created a plan and analyzed everything down to placement and power consumption.
- Filed all of the appropriate paper work and received approval.

Construction

- Be aware of Time & Delays

Completion

- Training and Operation

Question's

Utilities Assistance

Terri Meyer

Electric Vehicle Implementation Manager

Specializing in City, Counties, and Schools

Pacific Gas and Electric

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PG&E FleetReady Program

Together, Building
a Better California

FleetReady Program Overview

PG&E will help you install EV make-ready infrastructure for medium- and heavy-duty fleets

$236 million

budget over 5 years from 2019-2023

700+ sites

supporting 6,500 new EVs

Support conversion of commercial and public fleets to electric

Examples:

Delivery vehicles, school buses, transit buses, and more…

FleetReady Program Overview

PG&E will help you install EV make-ready infrastructure for medium- and heavy-duty fleets

Two ownership options offering significant cost benefits

PG&E constructs, owns and pays for all make-ready infrastructure from power pole to charger

OR

Participant constructs, owns and pays for behind-the-meter make-ready infrastructure and receives cost offset*

Additional Electric Vehicle Service Equipment (EVSE=charger) rebate available for schools**

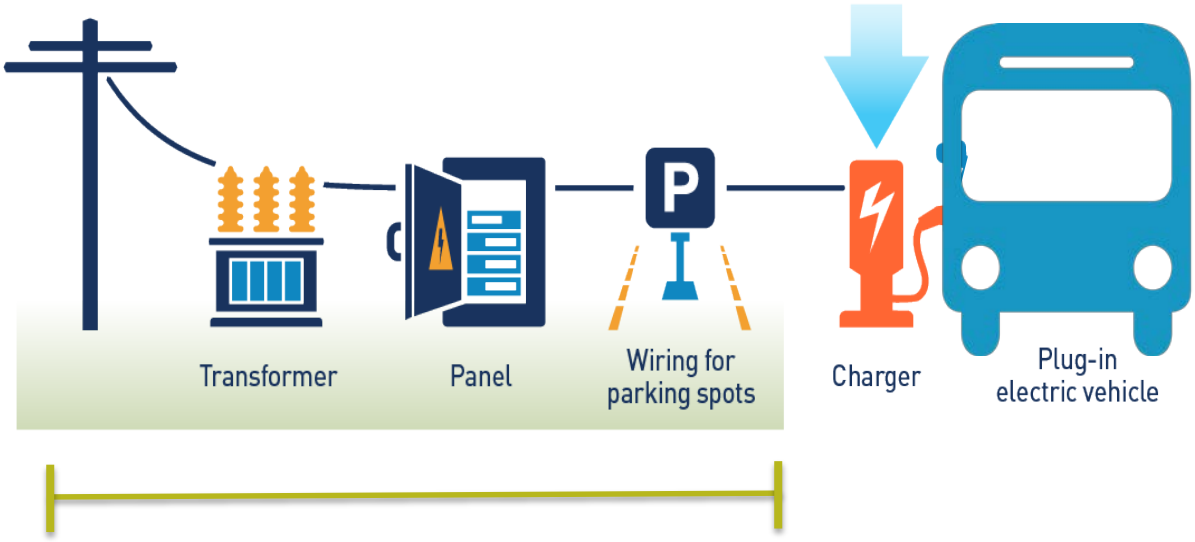
* PG&E constructs, owns and pays for make-ready infrastructure from the grid to the customer meter

** EVSE must meet minimum and standard requirements

FleetReady Ownership—PG&E-owned

PG&E pays for a significant portion of the total costs

PG&E-owned



Disadvantaged Communities, Schools, and Transit Agencies

Eligible for EVSE rebate up to 50% of charger cost

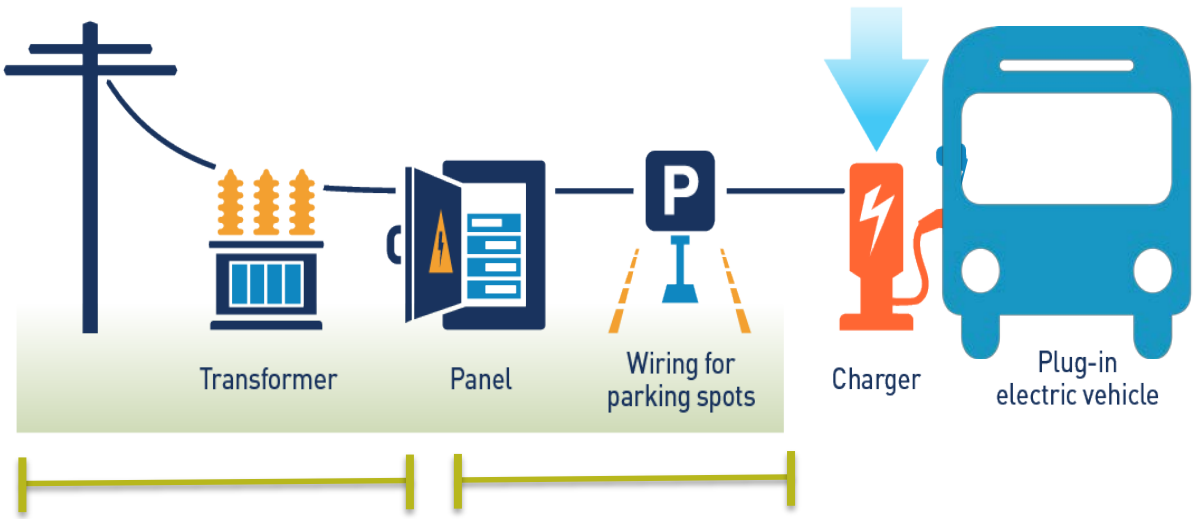
PG&E pays for, constructs, owns, and maintains all make-ready infrastructure

FleetReady Ownership—Customer-owned

PG&E pays for a significant portion of the total costs

Customer-owned

Program participant pays for charging equipment



Disadvantaged Communities, Schools, and Transit Agencies

Eligible for EVSE rebate up to 50% of charger cost

PG&E pays for, constructs, owns, and maintains all make-ready infrastructure to the customer meter

Customer pays for, constructs, owns, and maintains make-ready infrastructure from customer meter to EVSE

All Customer-Owned Infrastructure

Eligible for incentive of the **lesser** of 80% of customer-owned infrastructure costs
OR
Capped amount based on vehicle sector cap per vehicle

How to Prepare

What we need from you

Demonstrate commitment to procurement of a minimum of 2 electric fleet vehicles

Demonstrate long-term electrification growth plan and schedule of load increase

Provide data related to charger usage for minimum of 5 years

Maintain vehicles and chargers for minimum of 10 years

PG&E Process for Funding Coordination

CEC Electric School Bus Charging Infrastructure funding is stackable with PG&E FleetReady program funding

General process for stacking funding:

1. Submit interest form (application available Q1 2019): www.pge.com/EVFleet
2. A PG&E representative will reach out to learn more about your project plans and will stay with you from application to electrification, including:
    - Review of participation pathways, PG&E Service Planning coordination (no separate application), rates and site assessment for capacity and feasibility
3. Final design, construction, EVSE activation
4. PG&E and CEC coordinate on awarded funding
    - Infrastructure costs not covered through FleetReady are eligible to be covered with CEC funding
5. Rebate and/or incentive issuance if applicable
6. Ongoing operations and maintenance of EVSE

Thank you and any questions?

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Utilities Assistance

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San Diego Gas & Electric

Transportation Electrification Solutions for School Buses

Electric School Bus Charging Infrastructure Informational Workshop

Jaron Weston

November 29, 2018

Overview

- What electric utilities and utility programs bring
- Example customer journey
- How to best get involved

Medium-Duty | Heavy-Duty Program

Proposed Program Design

- SDG&E provides charging infrastructure to support a minimum 3,000 MD/HD vehicles (trucks, buses, forklifts, etc.)
- No limit on number of buses in program

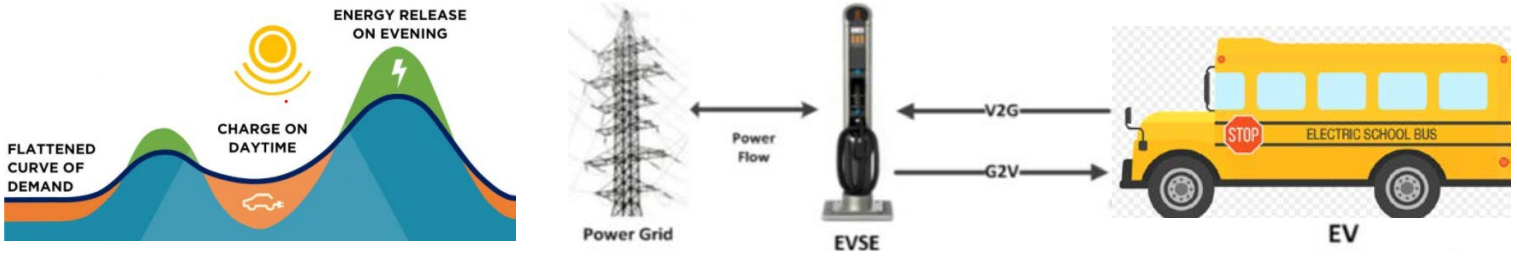
Program Schedule

- California Public Utilities Commission proposed decision possible by 1st quarter of 2019 ➔ SDG&E implementation could happen by 2nd half of 2019
- Five year enrollment period if approved

Vehicle to Grid Electric School Bus Pilot

Proposed Pilot Design:

- Deploy ten electric school buses at one school for a vehicle to grid pilot
- Buses operate normally, but during down time buses charge and discharge to optimize total cost of ownership
- Multi-year pilot with data collection analysis performed by SDG&E vendor



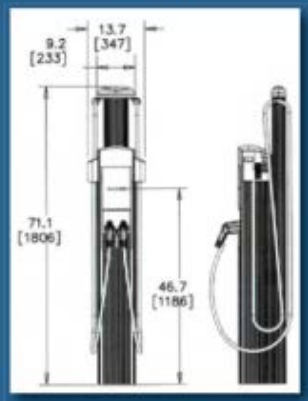
Light-Duty Vehicle Electrification for Schools (AB1082)

SDG&E Proposal:

- 184 Level 2 and 12 DCFC charging stations across 30 school facilities (K-12 and universities)
- For light-duty vehicles
- SDG&E owns, operates, and maintains the stations
- California Public Utilities Commission proposed decision possible by 1st quarter of 2019 ➔ SDG&E implementation could happen by 2nd half of 2019

What utilities and utility programs bring

Examples from Power Your Drive, a light-duty vehicle program

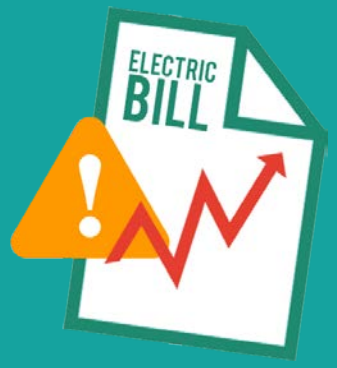


Circuit Attributes	Count
Total SDG&E Circuits	1,040
Circuits with Attributes	860
Circuits without Attributes	180*
*4 kV circuits not included in distribution	

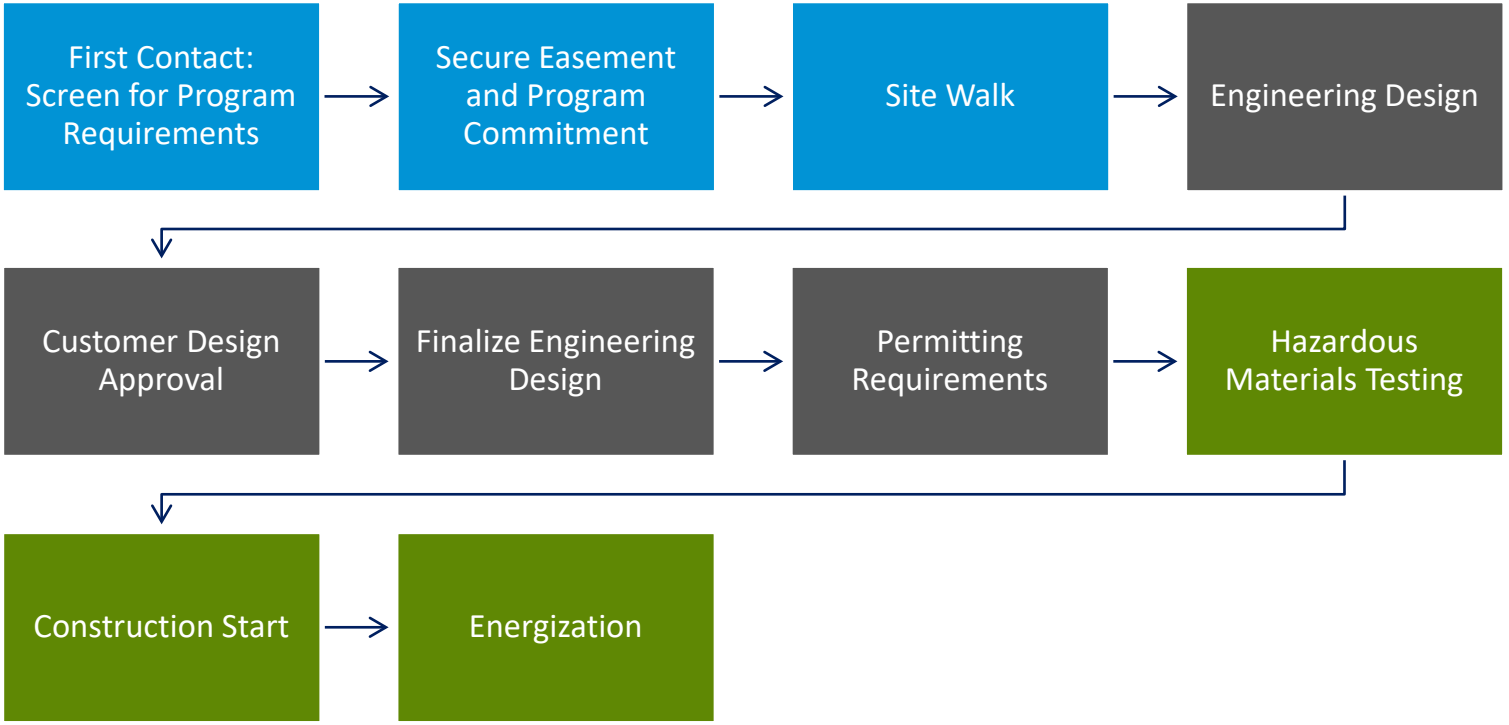
Circuit Type	Count
Residential (R)	196
Mixed(M)	451
Commercial & Industrial (C&I)	213
Circuit Type is classified as Residential, Mixed, or Commercial & Industrial if 70% of the total consumption on that circuit is from that class.	

Summer Week Day Peak Hour	Count
11:00-14:59	203
15:00-19:59	185
18:00-18:59	168
20:00-21:59	298
*6 Circuits (0.7% of population) with summer weekday peak hours between 22:00 and 10:59 are not included.	

Load Factor	Count
(H) High = >46.0%	443
(L) Low = <45.99%	417
(Average Hourly kWh / Peak kW)	



Example Customer Journey



How to best get involved

Communicate and involve us early

What are your needs, plans, and drivers?

- How many vehicles will you get? Timeframe?
- Where do you want them parked? Will this change if you expand?
- What cost drivers do you have? What space requirements do you have?
- What questions and unknowns do you have?

Q&A

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Infrastructure Development

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Stay Connected

School Bus Website/List Server:

- http://www.energy.ca.gov/transportation/schoolbus/index.html

- Follow instructions on bottom left corner

Contact:

Schoolbusprogram@energy.ca.gov
(855) 279-6381

Thank You!