

Rural School Bus Pilot Project Applicant Webinar

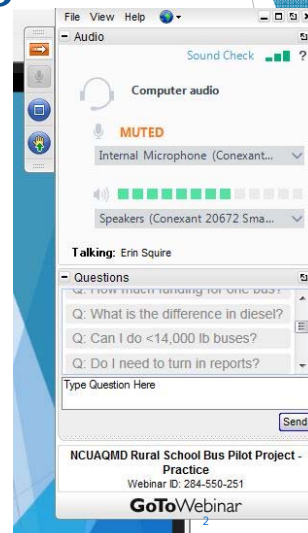
February 16, 2017



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How to Ask Questions

- Submit your questions by typing them in “Question Tab” as shown on the right hand side of your screen.
- Questions can be submitted at any time during the webinar.
- After the webinar you can submit questions to Erin Squire at esquire@ncuaqmd.org.
- Written responses to questions will be posted on our website.



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Introduction to the Rural School Bus Pilot Project

Presented by the North Coast Unified Air Quality Management District

February 16, 2017



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Overview

- Background
- Who is eligible for the program?
- Project Types and Options
- Application Process
- Contact Us

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Background

- Rural School Bus Pilot Project (RSBPP) is part of the California Climate Investments program.
- Funded by proceeds from California's Cap-and-Trade program.
- The North Coast Unified Air Quality Management District was selected to administer the program.



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Goals

- Program will accelerate the turnover of California's school bus fleet to zero-emission and cleaner-burning school buses
- Further California's goals of 1.5 million zero-emission vehicles on the road by 2025
- Reduces student exposure to pollutants making a positive impact on children's health



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Who is eligible to apply?

- Public School Districts
- Public Charter Schools
- County Offices of Education
- Joint Power Authorities (JPAs)
- Division of State Special Schools of the State Department of Education

To participate, applicants must own and operate a school bus that is at least 20 years old and is currently CHP Certified.

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Project Types

- Project Type = New School Bus Technology
- To be eligible for funding under this grant, a project must demonstrate a reduction in GHG and black carbon emissions.
- Project Types Include:
 - Zero Emission School Bus Technology
 - Hybrid or Internal Combustion Engine Technology, using Renewable Fuel Types

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Project Types: Zero Emission School Bus



Zero-Emission School Bus

- Allows for fleet expansion
- Battery electric or fuel cell
- Apply for up to three projects per applicant

Funding Amounts

- \$400,000 - school bus, taxes, delivery
- \$5,000 - electric school bus charging infrastructure
- Maximum funding level per project

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Project Types: Hybrid or ICE



Hybrid or Internal Combustion Engine (ICE) School Bus

- Replaces old bus (destruction required)
- New engine must meet the following emission standards:
NO_x - 0.20 g/bhp-hr and PM - 0.01 g/bhp-hr
- Apply for one project per applicant
- Requires the use of Renewable Fuel types

Funding Amounts

- \$165,000 - school bus, taxes, delivery, and incremental renewable fuel costs
- Maximum funding level per project

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Renewable Fuel

A reduction in GHG and black carbon emissions are possible because Renewable Fuel has a lower carbon intensity than its comparable non-renewable counterparts.

Renewable Diesel (renewable hydrocarbon diesel)

- Produced from nonpetroleum renewable resources (agriculture waste, animal fats, vegetable oil, etc.)
- Less carbon intensive
- Can be transferred and stored in the same infrastructure as traditional diesel

Biodiesel is not the same as Renewable Diesel

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Renewable Fuel Continued

Renewable CNG (biogas-derived biomethane)

- Derived from the anaerobic decomposition of organic matter in a landfill, lagoon, or digester
- Biogas is processed to remove water, carbon dioxide, hydrogen sulfide, and other trace elements, resulting in biomethane.

Renewable Propane (renewable liquefied petroleum gas)

- Produced from renewable feedstocks such as waste and residues
- Can be a byproduct of Renewable Diesel manufacturing
- Limited availability in California

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Funding Amounts

New School Bus Technology	Maximum Funding Level
Hybrid and internal combustion engine school buses and available incremental renewable fuel costs	\$165,000 (includes school bus, taxes, and incremental renewable fuel costs)
Zero-emission school buses	\$400,000
Electric school bus charging infrastructure	\$5,000

- Incremental renewable fuel costs are the difference in cost between the renewable fuel type and the comparable non-renewable fuel type that would be purchased to perform the same function
- Electric school bus charging infrastructure funding is per project (school bus)
- Projects that receive co-funding can not exceed project maximums

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Application Process



- Two-part application process
- Application Part A will be accepted **March 1 - 30, 2017**
- Application Part B only sent to applicants initially selected for funding.
- Award letters and Application Part B will be sent on or before **April 24, 2017**.

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How to Apply

Applications can be submitted in three ways:

- Using the online application submittal page
<http://www.ncuaqmd.org/index.php?page=rural.school.bus>
- Mail paper copy to the North Coast Unified AQMD
- Email application to esquire@ncuaqmd.org

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Post-Award Details

If you are selected for funding:

- Enter into a three-year agreement with the North Coast Unified Air Quality Management District
- Once agreement is signed by both parties, grantees have thirty days to submit a purchase order for the new bus(es)
- Required to submit annual reporting on the use of both the new and old school bus per the conditions of your grant agreement

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Additional Resources

- Alternative Fuels Data Center:
<http://www.afdc.energy.gov>
- Low Carbon Fuel Standard:
<https://www.arb.ca.gov/regact/2015/lcfs2015/lcfsfinalregorder.pdf>
- California Climate Change Investments:
<https://www.arb.ca.gov/cc/capandtrade/auctionproceeds/auctionproceeds.htm>
- Renewable Diesel vs. Biodiesel:
http://www.advancedbiofuelsusa.info/wp-content/uploads/2011/03/11-0307-Biodiesel-vs-Renewable_Final-3_-JJY-formatting-FINAL.pdf
- Rural School Bus Pilot Project Webpage:
<http://www.ncuaqmd.org/index.php?page=rural.school.bus>

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School Bus Vendors and Information

- Adomani
<http://www.adomanielectric.com/>
- A-Z Bus Sales
<http://www.a-zbus.com/>
- Bus West
<http://www.buswest.com/>
- Creative Bus Sales
<http://www.creativebussales.com/>
- First Priority GreenFleet
<http://fpgreenfleet.net/index.html>
- National Bus Sales
<http://nationalbus.com/Default.aspx>
- Motiv
<https://motivps.com/>

The North Coast Unified Air Quality Management District and the Rural School Bus Pilot Project are vendor and technology neutral.

Applicants may contact any vendor .

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Contact Us

North Coast Unified Air Quality Management District
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Eureka, CA 95501

(707) 443-3093

www.ncuaqmd.org

- Project Lead- Erin Squire, Special Projects Coordinator (x111)
esquire@ncuaqmd.org
- Project Support- Chrystal Ales, Administrative Support (x123)
cales@ncuaqmd.org
- Project Supervisor- Jason Davis, Division Manager (x114)
jdavis@ncuaqmd.org

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Cap and Trade
Dollars at Work

This project was supported by the "California Climate Investments"
(CCI) program

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Grant Specific Questions?

Erin Squire
North Coast Unified Air Quality Management District
(707) 443-3093 x 111

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Electric School Bus Overview

Presented by the Brett Gipe, First Priority GreenFleet
February 16, 2017



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Overview

- Why Electric?
- Factors & Considerations
 - Bus Technology, Specifications, Charging
- Next Steps

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Examples of Zero-Emission All-Electric School Buses



Trans Tech SStE Type-A



Starcraft Quest XL Midsize Type-C



eLion Type-C

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Why Electric School Buses & Why Now?

- Tremendous impact to driver & student/passenger environment and health
- Zero emissions, extremely quiet, eliminates vibrations typical to diesel buses
- Air quality benefits to general school population and area citizens (as well as those who ride/drive the buses)
- Sustainable transportation solution
- The Rural School Bus Pilot Project (and other funding options currently available and/or coming soon)

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What You Need To Know and Do

- **Make sure electric buses work for your district:**
 - Conduct *Route Profile Reviews* for compatibility to electric duty cycles (battery requirements) - evaluate with the bus Dealers to choose the appropriate configuration/specifications
 - Work with Dealer to map-out seating capacity needs; any possible wheelchair positions and lifts; A/C and/or heating needs; and other interior & exterior specifications needed/desired for providing a final bus quote
 - Have a charging infrastructure assessment done to understand what will be needed and estimated costs

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Other Considerations

- Driver & Technician Training Needs and Capabilities of Bus Dealer
- Warranties on Powertrain, Batteries, Bus Body, etc.
- Charging Infrastructure & EVSEs
 - Site Assessments
 - Power currently available
 - Charging: Single-Phase vs. 3-Phase
 - Type of connectors (Standard J1772, Meltric, other)
 - Installation and Equipment Quotes
 - Smart Charging & Reporting
 - V2G & V2B (current & future considerations)
 - Revenue generation & power outage management/recovery⁷

Route Analysis / Duty Cycle: Mission Match

- Work with Bus Manufacturer/Dealer to determine electric bus and battery requirements for meeting route needs
- Most buses on market have configuration availability of up to 100 miles on a single charge (size the battery based on route/load needs)
 - Ancillary loads must be considered and evaluated (heater, A/C, etc.)
 - Also, consider availability of "opportunity charging" - time and bus availability to charge between A.M. & P.M. routes
 - Total/daily mileage available for route match = approximately 140 to 160 miles p/day
- Route profile evaluation factors (miles, topography/grades, number of stops, speed, ancillary battery loads, route times, etc.)

Budgetary/Economic Considerations

- 70-80% *decrease* in fuel and maintenance costs
 - No oil changes
 - Brakes last 3-4 times as long
 - No DPFs or related costs
 - Reduced inspection times (employee cost savings)
 - No vibrations means less wear and tear on body & chassis (results in longer bus life-cycle)
- Workers Compensation claims reductions
- Possible reductions in other employee & insurance expenses
- Revenue generation is possible (V2G / V2B)

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Budgetary Considerations - Continued

California Infrastructure and Economic Development Bank (I-Bank)

- State agency can be “principle financing partner” for school districts
- Provides low-cost, long-term loans for public projects that promote clean energy
- May include alternative fuel vehicles, batteries, charging infrastructure, installation, etc.
- <http://gov-ibank-elb-78982517.us-west-2.elb.amazonaws.com>

V2G - Researchers at the University of Delaware evaluated the cost effectiveness of using a Vehicle-to-Grid (V2G)-capable electric school bus compared to a traditional diesel school bus and determined that the V2G-capable Type-A electric could provide the school savings of \$6,070 per seat or \$240,000 per bus in net present value over its useful life.

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Charging Infrastructure Considerations

- **Installation cost “drivers”**
 - Enough power at the site?
 - Distance from the electrical panel to the buses?
 - Daily mileage of driver routes (speed of charging needed)?
- **Charging station options** (Avg. cost range = \$3600 - \$5500)
 - Which amperage based on installation “drivers”
 - Vehicle to Grid (V2G)?
 - Single or dual charging station?
- **Software management platform configuration**
 - Access to non-bus drivers? If yes, for a fee?
 - Set scheduling time to avoid peak energy usage

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Charging Stations Basics

Networked versus Non-Networked

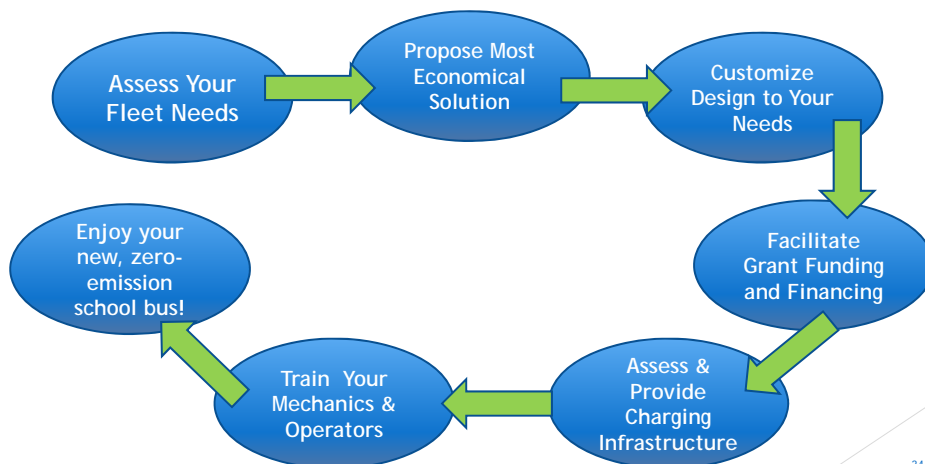
Features	Networked	Non-Networked
Cellular Modem	Yes	No
Data Collection, Reporting, Station Status	Yes	No
Control Use (Who and When)	Yes	No
Driver Payment Option	Yes	No
Remote Monitoring (Station Health, 24 x 7 Support)	Yes	No
Vehicle to Grid (V2G) Support	Yes	No
Reduced Electricity Costs	Scheduling & Carbon Credits	No
Purchase Price and Fees	Higher with yearly fees	Lower with no yearly fees

Smart, Networked Charging Stations Reduce Electricity Costs

- Schedule charging at night (or early morning) to eliminate utility demand chargers
- Monetization of Carbon Credits in California (~ 5 cents per kWh)
- V2G incentives from the utility (future savings)
- You control access to charging stations

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Pathway to an Electric School Bus



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Electric School Bus Questions?

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Mauro Bologna
Creative Bus Sales
(951) 235-9437

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Questions?



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Cap and Trade Dollars at Work

This project was supported by the "California Climate Investments" (CCI) program

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The image is a slide with a white background and blue geometric accents on the right and bottom edges. The logo for California Climate Investments is centered, featuring a blue triangle at the top with the words "CALIFORNIA CLIMATE" in white, and a green triangle at the bottom with the word "INVESTMENTS" in white. Between the triangles are three green curved lines. Below the logo, the text "Cap and Trade Dollars at Work" is displayed. At the bottom, a line of text states: "This project was supported by the 'California Climate Investments' (CCI) program". A small number "37" is located to the right of this text.