

Docket Optical System - 08-ALT-1

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DOCKET**08-ALT-1**

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CEC Survey Response: Battery Electric Transit Bus

Project Type: Heavy Duty Vehicle Deployment
 Fuel/Technology: Battery Electric
 Development Stage: Early Market Fleet Deployment

Concept:

15-30% of LA Metro transit bus needs require only morning and evening service, with typically 60 miles each. A battery electric bus with limited range (150 miles) is ideal for this application, as it can recharge mid-day and overnight, while offering Zero-Emission bus service and saving 14,000 gallons diesel-equivalent use annually, with savings of some \$30,000 per electric bus. CO2 emissions reductions of approximately 60% compared to conventional buses will result as electric buses replace. Further, increased ridership and a reduction in maintenance costs are expected.

Funding needs:

ISE Corporation is prime contractor in converting a LA Metro bus to battery electric operation, with CARB and SCAQMD as funding partners. The USDOE is offering "Transportation Electrification" funding from the American Recovery and Reinvestment Act which includes heavy duty vehicles, with stipulation of:

- Applications proposing less than 100 vehicles are deemed non-responsive to the solicitation,
- Recipient cost share is required to be 50% or higher from non-federal funds, (although the Secretary of Energy has statutory authority to fund at cost share lower, to 25%, upon justification.. but that the proposal will be rated lower in evaluation)

The total project funding required is expected to be in excess of \$100M, and thus the cost share is onerous. For example, to make this possible we propose the following:

- That the transit operator, provided the prototype bus meets the performance requirements, fund the production buses from local funds at 10% of the cost of conventional buses. Operator contribution: \$4M.
- That the battery cell supplier self-fund their portion of the warranty costs, estimated at \$4M
- That 80 of the 100 buses be delivered to LA Metro and operate in the Los Angeles air district, and that the SCAQMD fund the program at a \$4M level.
- That CARB and the CEC fund the program (AB118 funds) at a \$8M level
- That ISE use loan funds to contribute \$5M to the program.

The sum of these is \$25M, the minimum required for an application to the Transportation Electrification program.

Likely this will not happen ... we urge that significant effort funds be directed towards electric transit

bus development. Although ISE has received limited funding for the conversion of a single LA Metro bus from the ICAT program, which is being matched by SCAQMD, we have been unable to find federal support to match these state funds.

Expected Results:

- Fuel use savings of in excess of one million gallons equivalent per year, and multiples of these savings as battery buses become a national success story with increasing percentages of battery electric vehicles over the coming decade.
- Greenhouse gas reductions of approximately 10,000 tons CO₂ per year from this deployment alone, and multiples of this as more battery electrics are delivered in response to increasing interest and confidence in electric transit buses.
- Operating cost savings from efficient use of electricity rather than the less efficient engines, contributing in excess of \$2M/year for this 100 bus deployment (building with increasing hydrocarbon fuel costs).
- Increased ridership ... taking more cars off the streets and adding to the GHG contributions, yet to be quantified.

Compatibility with Sustainability Goals:

- Replacement of conventional buses is a most effective means of GHG reductions, amounting to 900-1000 tons CO₂ per bus (over the standard bus life of 12 years), depending on the electricity generation mix. (The reductions of CO₂ emissions are forty times the weight of the bus!)
- Initial deployment of electric buses will have a most limited negative effect on the environment, as much to the recharging is done at night no additional resources are required, and even for limited mid-day recharging. As major portions of fleets become all-electric there is expected environmental impact from wind turbine, solar thermal and solar photovoltaic, geothermal as well as other more conventional means of electrical power generation.
- Based on the limited introduction of fuel cell powered buses, electric buses will be very popular:
 - They are quiet,
 - They are clean and invite community acceptance,
 - The lack of vibration and shifting results in a smoother, more relaxing ride