



Session 2: Stationary and Infrastructure

Renewable Energy Generation to Support Electric Transportation



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Renewable DG projects Update

- RFP #P2011-21 released 5/6/11 and awarded at January 2012 Board meeting
- Incentivize 5 MW or more of clean renewable energy and storage projects
- Support electric transportation technologies
- Highlight four projects

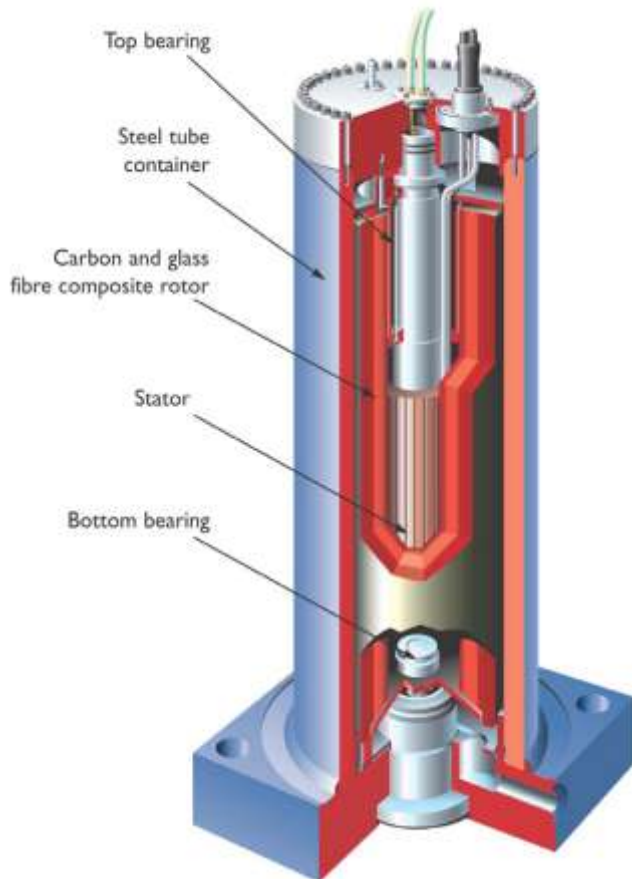


1 MW flywheel energy storage system at Los Angeles County Metropolitan Transportation Authority's Gold Line with 2kW of solar PV panels to power ancillary equipment.

Flywheel Energy Storage System

- Five 200kW GTR flywheels
- 2 kW of solar PV to support system
- Absorb braking energy as the trains enter the station, capture and store this energy by converting it to kinetic energy, and regenerate the stored energy into clean, instant power to accelerate trains leaving a station.
- Design for discharging 1.0MW for a minimum of 15-29 seconds and fully recharge within 30 seconds assuming sufficient DC track power is available.

Flywheel



Highland Park station



Trackside energy storage

- Reporting
 - Criteria pollutant and GHG emissions reductions
 - Flywheel electrical power generation and savings
 - Solar PV system generation
 - Enhanced train performance
 - Decreased resistor heating
 - Flywheel energy storage system performance



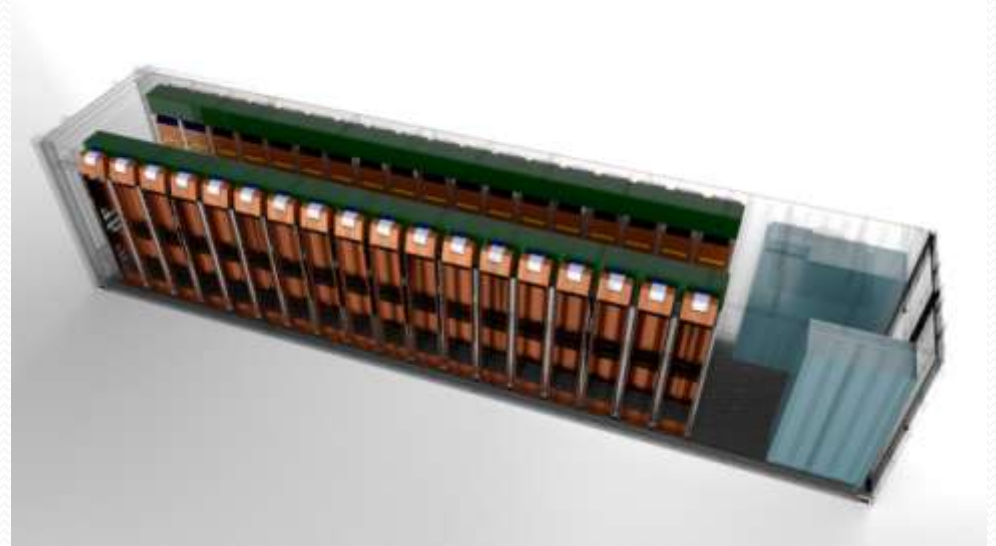


50kW solar PV rooftop system, 1.5MW lithium-iron-phosphate battery energy storage system and six Level-2 EV chargers.

Solar, Storage & EV chargers

- Manufacturer of lithium-iron-phosphate battery systems for transportation and stationary applications.
- Combination of battery storage and solar PV will be used to power Level-2 EV chargers to support and accelerate the deployment of in-basin electric transportation.
- Battery storage system used mainly for peak shaving, voltage regulation, power quality and reliability improvement.
- Peak kilowatt hours avoided will be quantified to determine the effective reduction in air pollution.

Solar PV Carport & Battery Storage



Reporting

- Criteria pollutant and GHG emissions reductions
- Annual output in kW-hours
- Peak kW-hours avoided
- Savings in renewable energy generation
- EV chargers kW-hr consumption, time and duration of EV charging opportunities
- Solar PV and battery storage system performance



2MW solar PV carport, 28 Level-2 EV chargers and 28 Nissan Leaf EVs for lease car-sharing program at the City of Industry's Metrolink train station.

City of Industry DG project

- 2MW solar PV system
- Electricity produced will be sold to Southern California Edison under a 20 year power purchase agreement.
- 28 Level-2 EV chargers installed at premium parking locations.
- 28 Nissan Leafs will be acquired to implement a cost-effective EV Commuter Rent/Lease Program at costs that are competitive with internal combustion vehicles to encourage the use of EVs by the general public.

City of Industry Metrolink Station



EV Commuter Rent/Lease Program



- Promote EV usage through innovative rent/lease program of 28+ EVs
- City to partner with established rental car agency
- 1/3/6 month rental, 1 year and 2 year lease options

Reporting

- Criteria pollutant and GHG emissions reductions
- Annual output in kW-hours
- Savings in renewable energy generation
- EV chargers kW-hr consumption, time and duration of EV charging opportunities
- PV solar system and EV commuter rent/lease program performance



500kW solar PV, 2 MWh lithium-iron-phosphate battery storage systems and Level-3 EV charger to support electrification of diesel trolley.

Solar, Storage, Fast Charging & Smartgrid

- 500kW solar PV system
- Two 1MWh battery energy storage systems.
- Diesel Trolley Bus conversion to electric drive
- Level-3 EV charger to support the operation of electric Trolley Bus.
- Provide controlled monitoring to 13 Level-2 EV chargers throughout City of Riverside.
- Employ a unique utility-connected smartgrid which couples energy generation, storage, and electric transportation to develop improved energy systems for the future.

Battery storage and Solar PV

1.1 MWh Lithium-ion battery at UCR



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UCR Planned Solar PV Systems

Solar PV Systems
500 kW CE-CERT/Bourns
(up to) 1.2 MW UCR west campus



Electrification of diesel trolley bus



- Tailpipe emissions reductions compared to diesel Trolley Bus prior to electric conversion to be quantified.
- Conduct surveys to capture experience and feedback of electric Trolley Bus operator.

Reporting

- Criteria pollutant and GHG emissions reductions
- Annual output in kW-hours
- Peak kW-hours avoided
- Savings in renewable energy generation
- EV chargers kW-hr consumption, time and duration of EV charging opportunities
- PV solar system, battery storage and trolley bus electrification performance

QUESTIONS?

