

Electric Vehicles and Government Fleets

Presentation for State
Departments of Transportation

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- BACC overview
- Why EVs?
- Bay Area EV Ecosystem
- EV Fleet project overview
- Forward-looking strategies

Bay Area Climate Collaborative



- Private-public 501c3 partnership
- Accelerating the **clean energy economy**
- **Scalable market-oriented initiatives**
- Project of the **Silicon Valley Leadership Group**



Why EVs?



Automaker Plans

Market Launch
Chevy Volt



Market Launch
Leaf EV



Market Launch
EV SUV



Transit Connect EV
Focus EV



Production
EV for U.S.



More OEMs
More Models

2009

2010

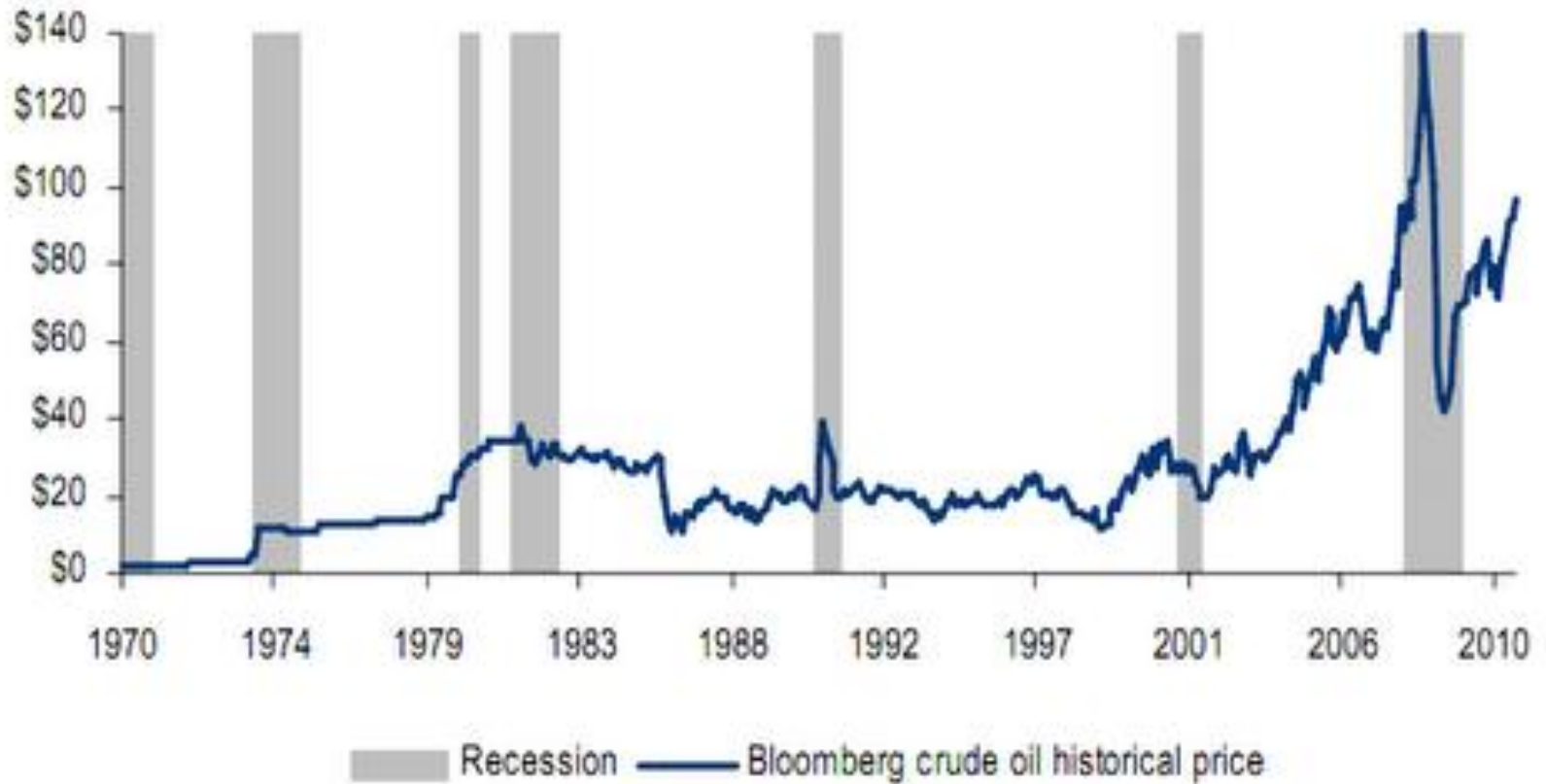
2011

2012

2013

2014

Historical crude oil price, 1970-present



Inflation Adjusted Monthly CRUDE OIL PRICES (1946-Present) In April 2011 Dollars

© www.InflationData.com
Updated 5/13/2011



Source of Data:

Oil Prices- www.ioga.com/Special/crudeoil_hist.htm

CPI-U Inflation index- www.bls.gov

Why EVs? Fuel Cost Comparison



\$0.10-0.15 per mile



\$0.03 per mile

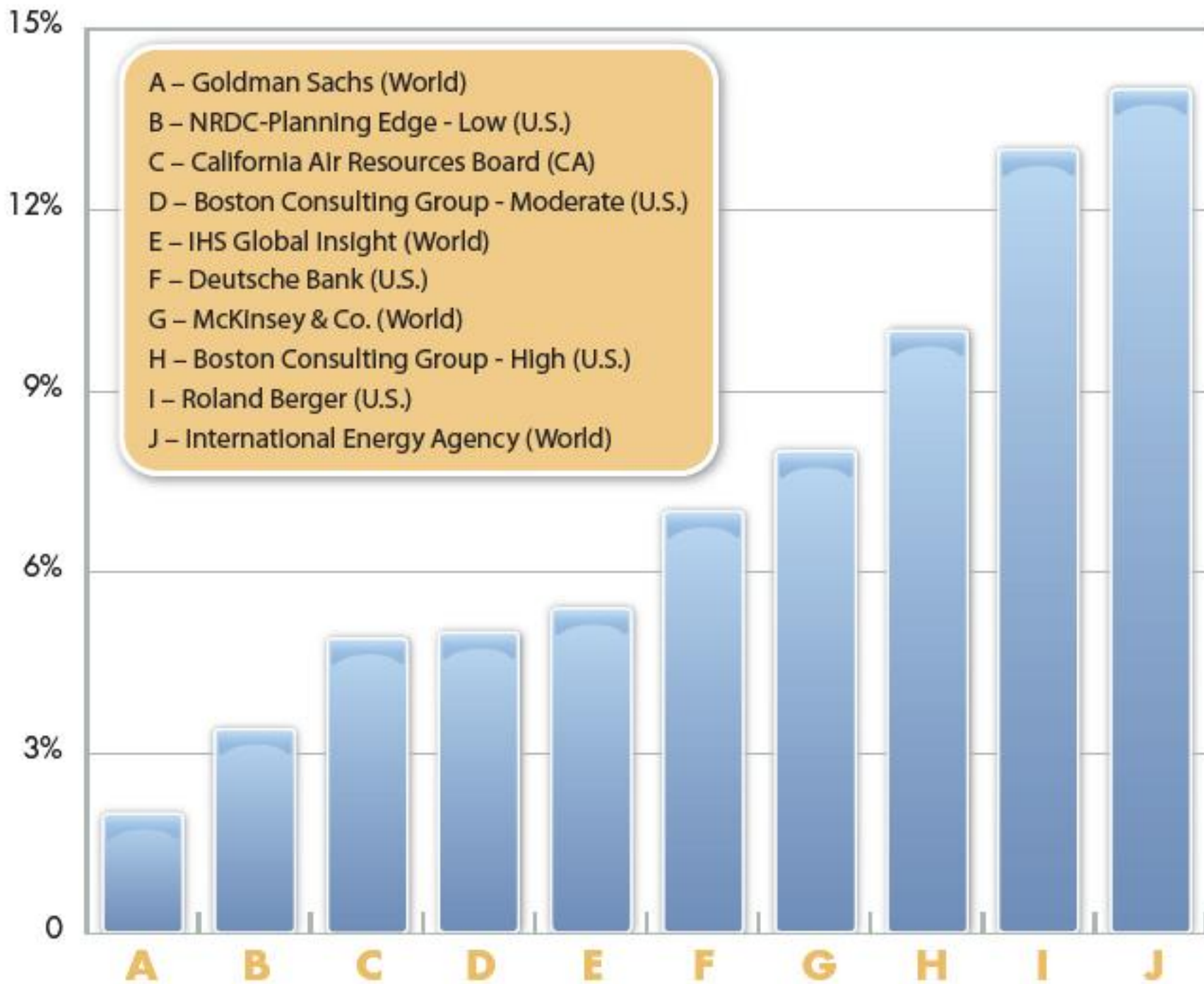
Stanford Study (2010) 5 Year Cost Benefit Analysis

	ICEV NPV	EV NPV	Difference
Purchase	20,000	30,000	-10,000
Maintenance	3,025	1,480	+1,545
Fuel/ Battery	9,690*	6,538**	+3,152
Insurance, License, Registration, and Tags	8,845	9,911	-1,066
Depreciation	10,963	8,557	+2,406
Incentives		-8,500	+8,500
PV of cost	52,523	47,987	+4,536

* Assumes \$3/gallon (+\$45/mo per added \$1/gal) electricity costs \$.09/kWh

** Includes battery charger and installation (\$3,000)

PEV SALES SHARE IN 2020





1983

THE EVOLUTION OF THE CELL PHONE.

2008





Bay Area EV Ecosystem

Bay Area EV Strategic Council

“Big 4” Mayors

San Francisco
Oakland
San Jose
Berkeley

Public Agencies

Bay Area Air Quality Management District
Association of Bay Area Governments
Metropolitan Transportation Committee

Key Businesses

Coulomb
Tesla
CODA
ECOtality
Better Place
Kleiner Perkins
Silicon Valley Leadership Group
Itron
PG&E

Key NGOs

City CarShare
Plug In America
Clean Cities Coalition

Goal: Top % of EVs in U.S. – 100K EVs by 2020 (per Clean Air Plan)

Actions: EV Plan, Go EV Campaign, Aggregate Purchase, Ready Set Charge Guidelines

Co-facilitators: Richard Schorske – Executive Director, EV Communities Alliance; Rafael Reyes – Executive Director, Bay Area Climate Collaborative

GOALS

ACCOMPLISHMENTS

- Scale-up EVSE network to solve range anxiety and needs of “garage-less”

- 50+ Fast Chargers in ‘12, ~70+ in ‘13
- ~1400+ public L2s by 2013
- \$30M+ public \$ in EV charging & pilots

- Spur EV demand via a strong “Go EV” outreach and education campaign

- \$900K from MTC for “Go EV” public campaign
- CityCar Share & Better Place pilots funded

- Establish EV-friendly road access, parking, building codes & policy

- \$625K *Ready, Set, Charge California* initiative to promote EVSE installation streamlining & EV friendly building codes region-wide

- Develop aggregate purchase & innovative financing to reduce EV price barriers

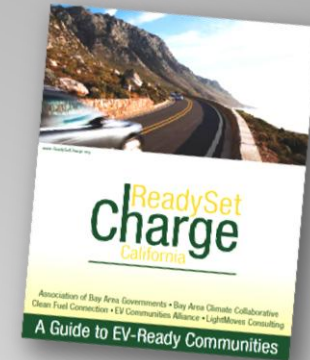
- Rockefeller Brothers funded EV aggregate purchase & V2G project under development



Readiness Considerations

Readiness Considerations

1. Education
2. Infrastructure
3. Utilities

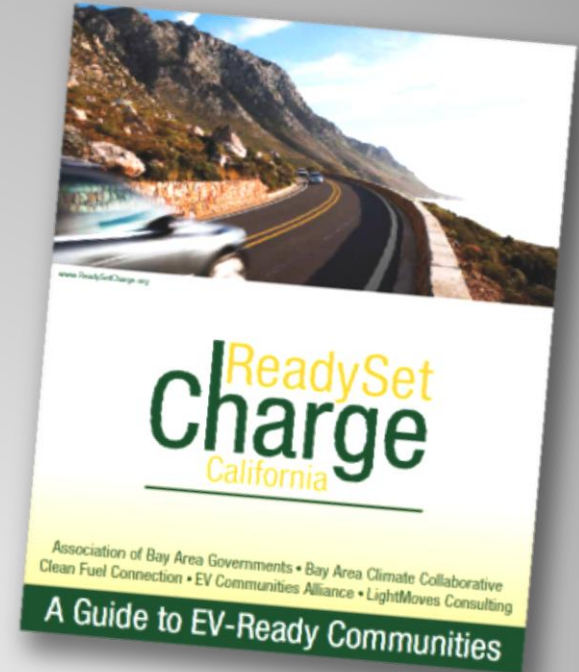


Address basic education

Local Government EV Readiness

- Zoning
- Building Codes
- Permitting
- Installation
- Utilities
- Fleets

Developed with 40+ leading local government, utility, EV experts



www.readysetcharge.org

Readiness Considerations: Charging Infrastructure Prioritization

Public

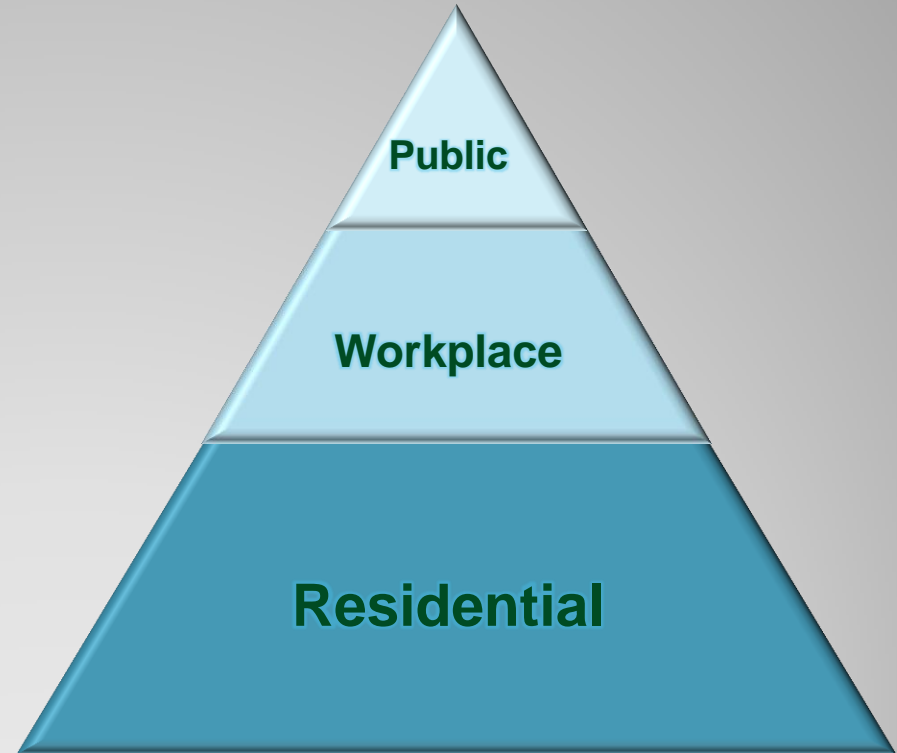
- High visibility
- Commercial/Retail
- Public education and outreach

Workplace

- Corporate
- Municipal parking lots

Residential (majority)

- Satisfying consumer-driven home installation process
- Permits, electrical contractors, inspections, meters, rates



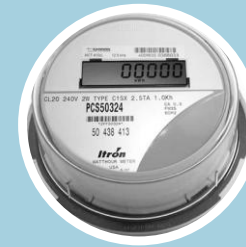
Readiness Considerations:
Local grid & utility notification

Local governments



EVSE installation permits
Municipality-owned utilities

Utilities



Assess local electrical capacity
Rate options
Outreach and education



Prompt notification of deployment
Encourage off-peak charging



Local Government EV Fleet National Demonstration Project

EV National Demonstration: Overview



- **Leadership**
 - 90 vehicles
 - \$5+ million
 - 11 agencies

- **Catalyze market**
 - Regional publicity
 - National outreach

EV National Demonstration:
Vehicle Distribution

	Sedans	Vans
Alameda Co.	20	4
Concord	10	0
Fremont	2	0
Marin MWD	0	3
Oakland	3	0
San Francisco	12	2
San Jose	3	0
Sonoma Co.	29	2
Totals	79	11

5 year impact

Distance
3 million miles

Avoided
170,000 gal. gas
2.2 million lbs CO2

Gas savings
\$700,000

- **Grant Challenges** - FHWA/Caltrans process and requirements
- **Education** – Fleet managers, utilities, drivers, leadership
- **Infrastructure** - Siting, electrical
- **Shifting standards/technology** – Fast charge connectors, network communication

EV National Demonstration: Charger Siting

CHECKLIST FOR EVSE LOCATION SELECTION WORKSHEET					
COUNTY OF SONOMA, FLEET VEHICLES					
Building Name, Number					
Building Address					
Occupant Department(s)					
Fleet Operations:				YES	NO
Are there County vehicles at the location?					
Is there a plan for County vehicles at location?					
Is this location primarily for opportunity charging?					
How many potential EVs/PHEVs at this location?					
Facility Operations:					
Is there adequate parking to restrict spaces for EVs?					
Does the facility have adequate power for EVSEs? (220V/40A)					
If so, how many EVSEs can be supported?					
Can at least one space be designated as "Accessible Parking"?					
Cellular Reception					
ADA Accessible?					
General Services – Real Estate – Architecture					
Is the building owned or leased?				Owned	Leased
Will the landlord allow EVSEs installed at their building					
How will the electricity be metered and billed to the County?					

- **Regional engagement**
 - Experience a vehicle
 - Make them visible
 - Earned media
 - Local fleet outreach



- **National outreach**
 - Analytics
 - Best practices guides/reports
 - Earned media
 - Collaboration on outreach/visibility



Looking-forward Strategies

Challenge

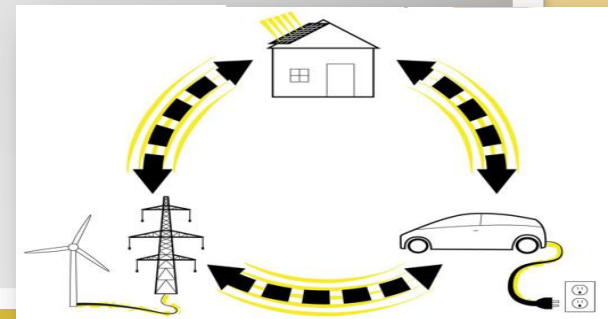


\$26,000
+
\$294/mo

\$35,000
\$26,000
+
\$200/mo



1. Aggregate EV Purchase
2. Battery Financial Repackaging
3. Participation in Energy Services



Aggregate EV Purchase

- **Volume discounts** – pooled buy
- **Leverage affinity networks** –
Business associations, credit unions,
environmental and consumer orgs
- **Fleets** - municipal and private
- **“Free”/low-cost residential EVSE**
- **Supported by “GO EV campaign”**



Looking-Forward Strategies:
Battery Financial Repackaging

Subscription business model. Lowering up-front costs.

Battery leasing. \$9,000 for Nissan Leaf could lower initial price.

Packaging with EV “fuel” payments and/or EVSE network access. (NRG model) likely to enhance consumer interest.

GE Capital and other finance entities interested.





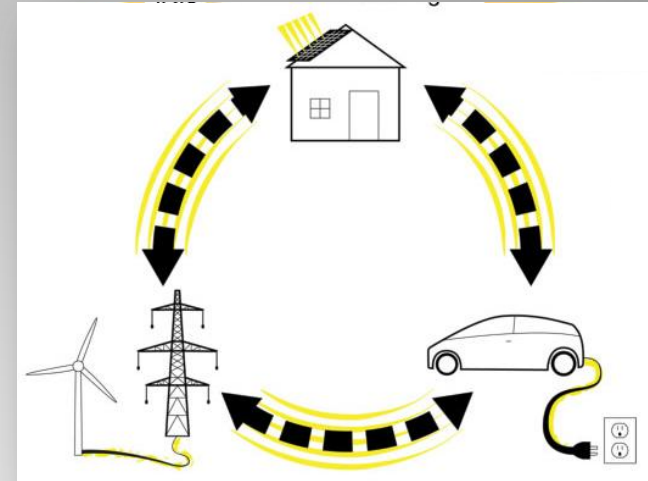


- **Backup Power** – Disaster/emergency power for tools and appliances
- **Vehicle to Building** – Peak power cost shaving
- **Demand Response** – Curtail demand at charger for demand events
- **Frequency Regulation** – full “vehicle to grid”

Looking-Forward Strategies: Vehicle to Grid (V2G)

Mid-Atlantic Grid Interactive Car Consortium (MAGICC).
Demonstrated commercial payment of \$2K per vehicle/year.

EVGo Markets. NRG plans to offer EV owners A/S revenue.



California PUC facilitates V2G development. April 2012

California ISO testing. Plans for V2G with buses

V2G & Microgrids at scale. U.S. Dep't of Defense will deploy (technology from REV, Honeywell, SAIC)

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