



Los Angeles
Department of
Water & Power



EV Bus Charging Utility Opportunities

**Advance Clean Transit Symposium
CA Air Resources Board, April 8, 2016**





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Discussion Today

Discussion today centers on:

- Utility Perspective for EV Charging.
- What is the story on rates? (TOU, Demand, etc.)
- Infrastructure
- Opportunities for Savings & Collaboration.



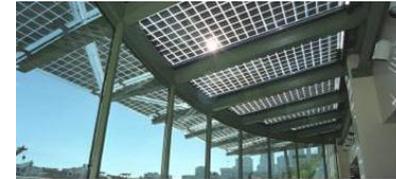


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DWP's EV Charger Program

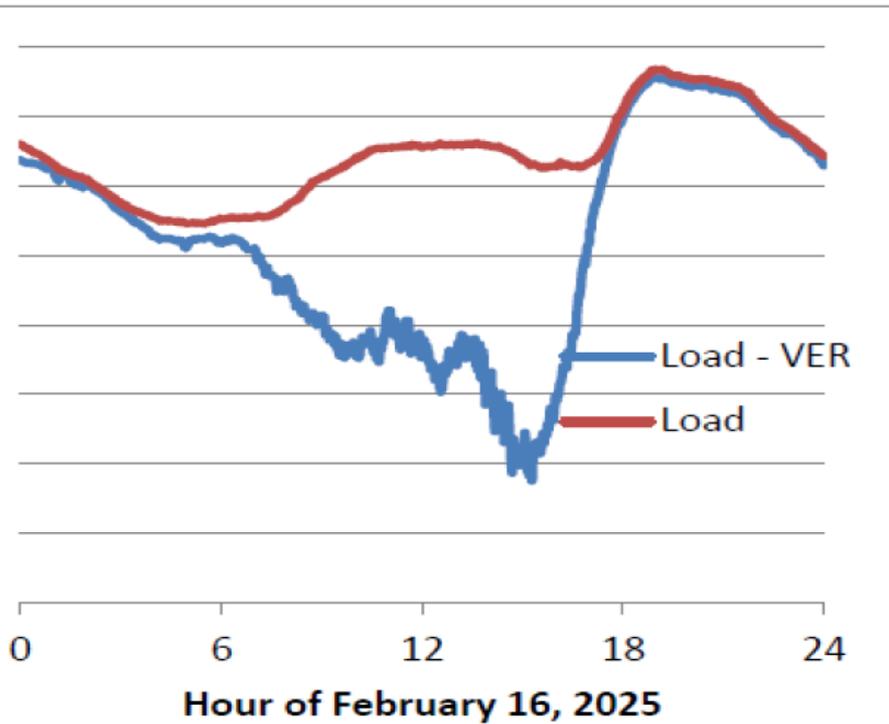
Why We Encourage Electric Vehicles (EVs)...

- Promote a green environment. (75% less GHG than gas).
- Promote customer efficiency
(less than \$1 per gallon of gas)
- Build a new industry for jobs.
- Integration of renewable.
- Local green energy
- Better use of utility assets.
- Every BEV = 1/2 a house night load.

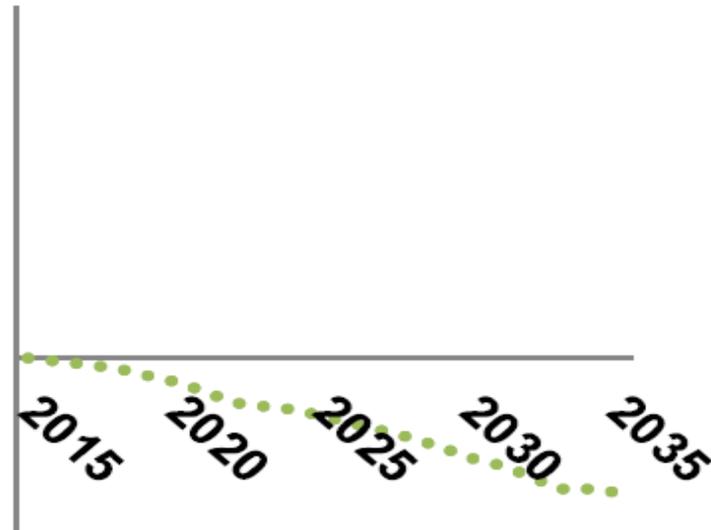


Benefits to Customers

- Energy sales off peak saves everybody money. (Cents/kWh)
- Transportation Electrification is the only program to lower the cost of electricity for all customers:



EV (Preferred)





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How EV Bus Charging Solves These Problems.

- An electric bus is equivalent to approximately 20 light duty EVs (depending on usage).
- Most charging can be done off peak.
- Mid-day charging may help solve over generation of solar.
- Smart Charging will assist.





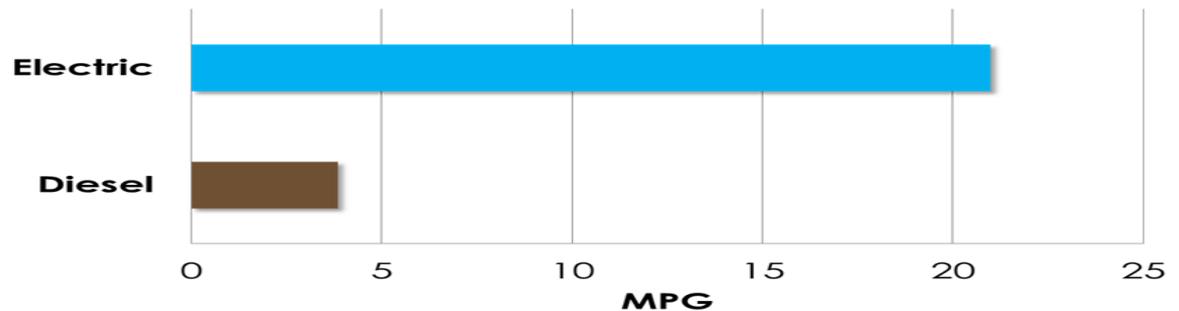
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How to Save Money...

- If you use power, do it efficiently.
- If you don't need it, turn it off.
- Use electricity when it is cheap. (Rates: Off peak, Future Dynamic Pricing and Demand Response).
- Make your own electricity.(Solar, Energy Storage)

KEY POINT: EV Busses need to be competitive with total cost of ownership for other technologies

Electric Buses Are 5x More Fuel Efficient than Diesel



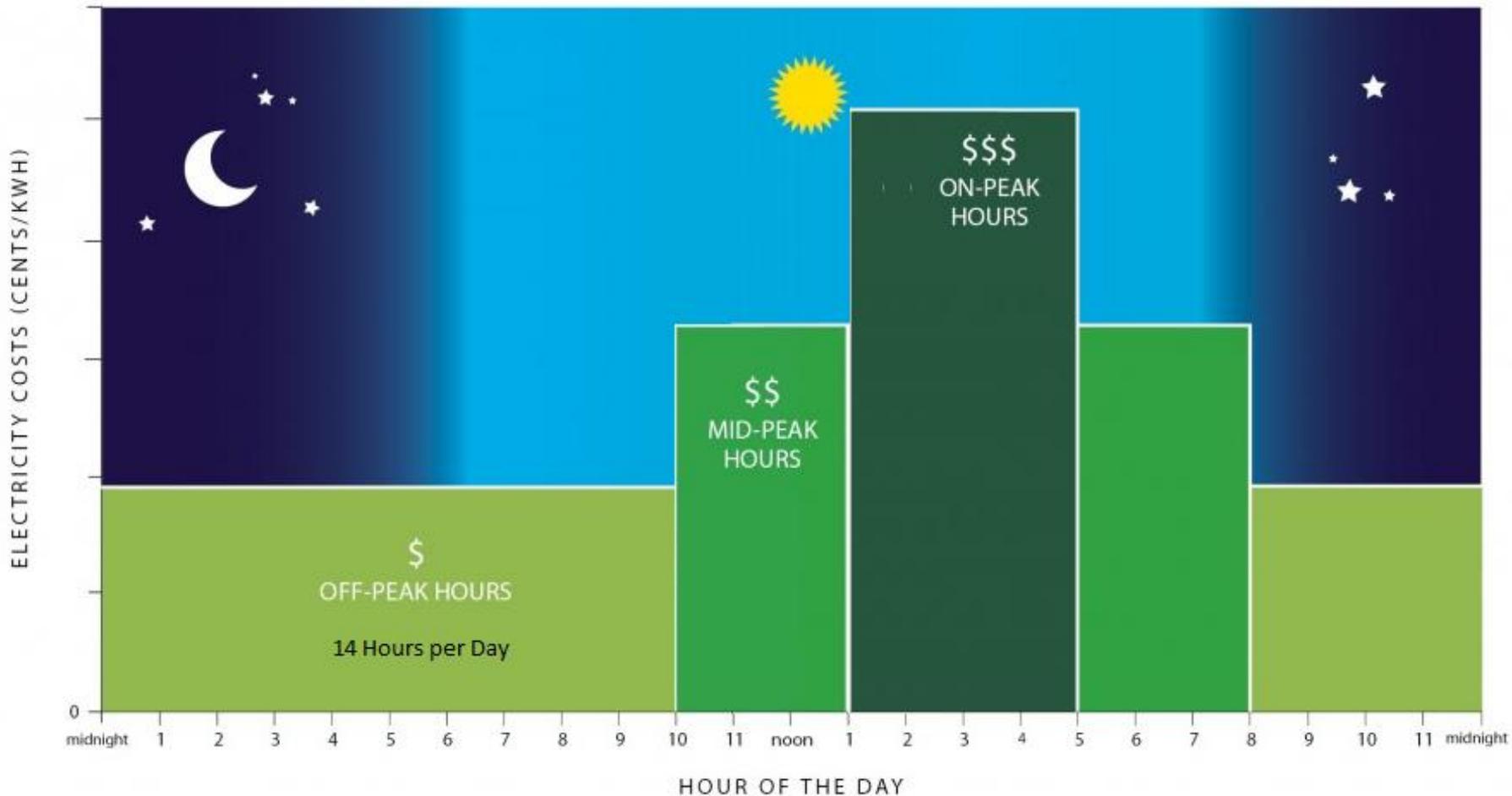
Source: Penn State Bus Testing and Research Center, NTD





Time-Of-Use (TOU) Rates

LOS ANGELES DEPARTMENT OF WATER AND POWER'S TIME-OF-USE RATE FOR EV CHARGING



EV Discount is 2.5 cents off the normal Off Peak Rate. Weekends are all Off Peak Base Rate



Electric Rates- Demand Charges

- **Demand Charges:** Recovers cost for being able to deliver large quantities of power no matter how frequent. May or may not be time sensitive.
- **Solutions for Demand Charges?**

Utility Demand Charges - Nissan Leaf		Cost/mo.
CA	Glendale Water and Power	\$ 16.00
	Hercules Municipal Utility:	\$ 377.00
	Los Angeles Department of Water and Power	\$ 700.00
	Burbank Water and Power	\$ 1,052.00
	San Diego Gas and Electric	\$ 1,061.00
	Southern California Edison	\$ 1,460.00
AZ	TRICO Electric Cooperative	\$ 180.00
	The Salt River Project	\$ 210.50
	Arizona Public Service	\$ 483.75
OR	Pacificorp	\$ 213.00
WA	Seattle City Light	\$ 61.00



Different Charging Strategies

- Maximize Off Peak Charging (may work for mid-day, too)
- Tie to another large load (building) and turn something off when the charger is on. (i.e. pumps, HVAC)
- Sign up for a Demand Response Program.
- Rotate charging...not all at once.
- Charge Slower.
- Use the charger as often as possible
- (Future) Explore energy storage.

Bottom Line: It is not just the rate...

It is how you use it!





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Installing Infrastructure

- New Service or Existing Service Load Increase?
- Line Extension (Free Allowance) & On Site Transformer
- Check the rate options.
- Other Funding :
 - Government Grants
 - Utility Incentives
 - Low Carbon Fuel Credits
 - 30% Federal Tax Credit





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What Is DWP Doing to Support Infrastructure?

City Infrastructure:

- Retrofitted and installed over 300 chargers on City Property. Includes LADWP, City Hall, the Convention Center, LAX, City Parking Structures. More in progress.
- Installed 16 DC Fast Chargers in and around LA.

Customer Infrastructure:

- Residential Charger Rebates for 4.5 years.
- Commercial Charger Rebates for 2.5 years.
- Grants for Heavy Duty EV





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What's Next for LADWP?

- Education and Outreach (i.e. Drive Events, Recognition).
- Municipal Leadership (Municipal fleet and Policy).
- Publicly available charging on City Property. (L2, DCFC)

NEW CUSTOMER EV CHARGER REBATE PROGRAM

- Residential Infrastructure
- Commercial Infrastructure for public, workplace.
- **Heavy Duty Charger Incentives.**



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Questions

