DOCKETED

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Transportation Electrification

BWP's Integrated Resource Planning

CEC Workshop

October 5, 2016

CITY OF BURBANK
INCORPORATED 1911

CITY OF BURBANK
Water and Power
Since 1913
Always There for You!

Initial Goals

01 Introduction
BWP overview

02 Achievements
Public chargers, TOU rates, rebates

03 Current
Capabilities and challenges

04 Sectors
Sector-specific plans

05 Operations
What are the impacts of maintenance, distribution operations, rates, etc?

06 Next steps

BWP
Summary

BWP's Electric Load

45,071
Residential

of Load

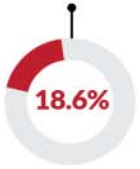
5,534
Small Commercial

of Load

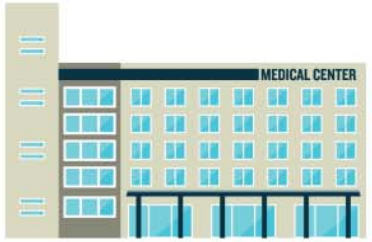
1,051
Medium Commercial

of Load

95
Large Commercial



of Load

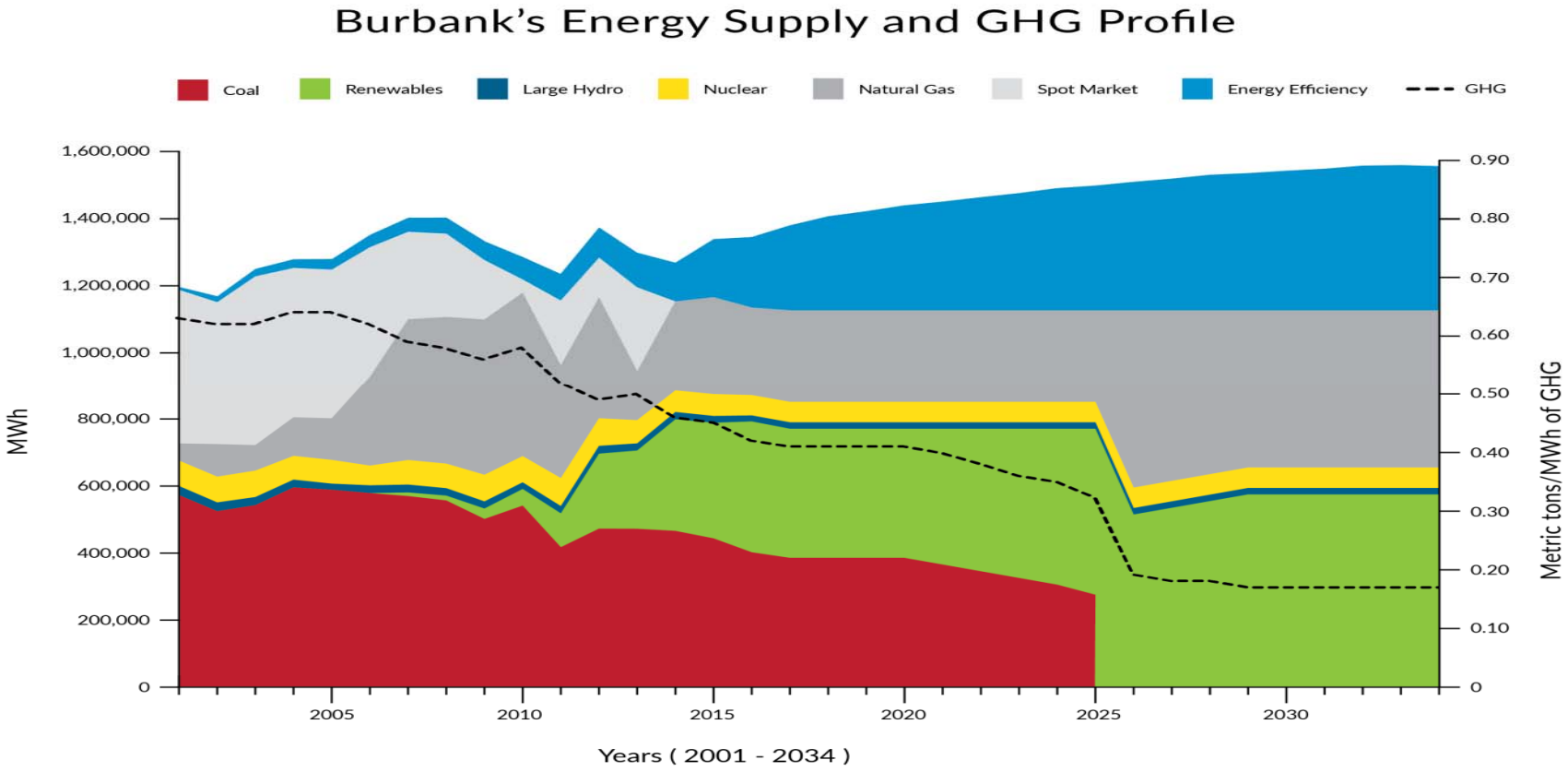


41
Extra Large Commercial

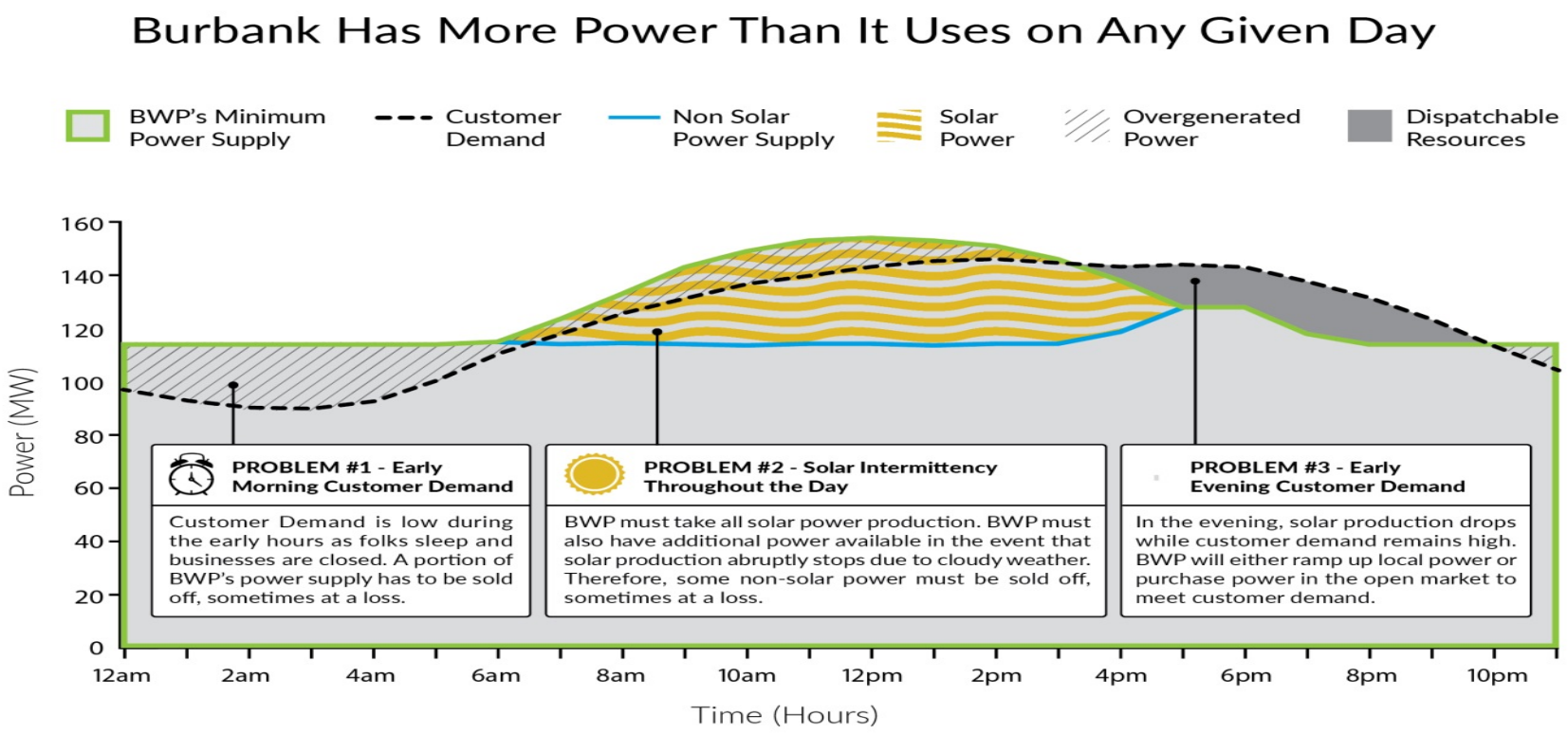
of Load

Street lighting charges and temporary power construction projects comprise the remaining 3.4%.

BWP
Summary


Burbank's Energy Supply and GHG Profile
Coal
Renewables
Large Hydro
Nuclear
Natural Gas
Spot Market
Energy Efficiency
GHG
MWh
Metric tons/MWh of GHG
1,600,000
1,400,000
1,200,000
1,000,000
800,000
600,000
400,000
200,000
0
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0
2005
2010
2015
2020
2025
2030
Years (2001 - 2034)

BWP
Summary


Burbank Has More Power Than It Uses on Any Given Day
BWP's Minimum Power Supply
Customer Demand
Non Solar Power Supply
Solar Power
Overgenerated Power
Dispatchable Resources
Power (MW)
160
140
120
100
80
60
40
20
0
12am
2am
4am
6am
8am
10am
12pm
2pm
4pm
6pm
8pm
10pm
Time (Hours)
PROBLEM #1 - Early Morning Customer Demand
Customer Demand is low during the early hours as folks sleep and businesses are closed. A portion of BWP's power supply has to be sold off, sometimes at a loss.
PROBLEM #2 - Solar Intermittency Throughout the Day
BWP must take all solar power production. BWP must also have additional power available in the event that solar production abruptly stops due to cloudy weather. Therefore, some non-solar power must be sold off, sometimes at a loss.
PROBLEM #3 - Early Evening Customer Demand
In the evening, solar production drops while customer demand remains high. BWP will either ramp up local power or purchase power in the open market to meet customer demand.

Achievements:

Parking Lot Chargers

Created initial charging network in 2011 using DOE grant and Chargepoint as equipment and back office provider.

Curbside Chargers

Expanded successful charging network in 2015 using CEC ARFVTP grant to public right-of-way using Greenlots as equipment and back office provider.

EV Program

- DCFC Charger
- TOU rates
- Rebates

BWP
Currently

Capabilities

- EV Program with an established Budget, and Roles for Marketing, Project and Engineering Functions.
- Internal or turnkey installation approach.
- Full electric AMI – ability to monitor usage without expensive charger networking options.

Challenges

- Incorporating EV-related electric load into current utility operations.
- Balancing the promotion of transportation electrification with BWP mandate to provide reliable, affordable, and sustainable electric service.
- Competing funding priorities.

BWP
Campus

Fleet Vehicles

- 5 battery electric cars.
- 6 plug-in hybrid cars.
- 2 plug-in hybrid trucks.
- Replacement of ICE cars with plug-ins and battery electric cars as feasible.

Employee Charging

- 6 Level 1 outlets – default.
- Additional chargers as necessary.

Public / Corridor Charging

Summary	**11 Chargepoint Level 2 chargers installed in parking lots in 2011.** **16 Greenlots Level 2 chargers installed curbside in 2015.** **1 Greenlots Level 3 (DCFC) installed on Pass Avenue in 2016.** **Public charging should include Level 2 and 3 chargers; use of Level 1 charging in Burbank has been less than 1% of total.**
Advantages	BWP can monitor and control usage and pricing at each charger. Usage is reportable to CARB for LCFS credits.
Disadvantages	Initial capital expense.
Benefit-Cost	Benefits = $135 in gross revenue (based on 800 kWh) per charger per month. Maintenance Costs = 1 call per month, estimated at $75. Electricity Costs = $25 per charger per month (based on marginal fuel costs of 3 cents per kWh).

Public / Corridor
Charging - continued

Target Market	All EV drivers. Out of town visitors to Burbank. Multifamily residents - without access to individual chargers. Small business employees - without access to large parking lots that are more conducive to charger installation.
Next Steps	Install additional chargers as necessary. Minimize cost by installing many chargers at few locations (as opposed to curbside program of 2 chargers at many locations). Research cheaper equipment options, such as non-networked chargers.

Residential Single Family
Charging

Summary	**48 home charging credits (for Level 1 or 2) received prior to 2015.** **23 Level 2 home charging rebates in FY 15-16.** **100 Level 2 home charging rebates forecast for FY 16-17 (with annual doubling.)**
Advantages	BWP's lowest cost option for promoting home charging, limited to $500 per home. BWP gains visibility into where these homes and chargers are and can somewhat control usage through the mandatory TOU rate.
Disadvantages	Customer interest may be limited due to high installation costs, and mandatory TOU rate. Customer installation costs can range from $500 to $1,000, depending on proximity to source of 240V power.
Benefit-Cost	Benefits = $240 in gross annual revenue (based on 3,000 kWh), equating to a discounted $1,600 over a ten year lifetime. Rebate Costs = $500.

Residential Single Family
Charging - continued

Target Market	Single family residents.
Next Steps	Continue promoting the rebate program. Monitor for changes in equipment and installation cost, and customer satisfaction with mandatory TOU rate.

Multi Family / Workplace
Charging

Summary	**Level 1 and 2 charging at Burbank Multi Unit Dwellings (MUD) and Employers.**
Advantages	BWP's cost is limited to the rebate (if applicable); much cheaper than installing public chargers. Level 1 charging is adequate for workplace, given the long (8-10 hour residence times). EV charging load profile will match existing commercial customer load profile.
Disadvantages	Impossible for BWP to monitor or control usage without dedicated meter and service, which increases cost.
Next steps	Workplace and Employer survey to determine size and potential of market. Work with Community Development Department to investigate City Ordinance requiring EV infrastructure at each new or retrofitted MUD or commercial property.

BWP
Operations

Maintenance

Current practice is re-active, based on when equipment faults occur.

Distribution Operations

All current EV charger installations, including by customers, require a Plan Check and Electrical Permit to ensure adequate electrical power.

EV Charging Rates
Residential

Residential Single Family	Default is tiered rate. Voluntary whole home TOU rate for Early Adopters. Mandatory whole home TOU rate for Level 2 charger rebate recipients.
Residential Multi Family	If individual electrical service: Default is tiered rate. Voluntary whole home TOU rate for Early Adopters. Mandatory whole home TOU rate for Level 2 charger rebate recipients.
Multi Unit Dwelling	If common electrical service: If residential account, default is tiered rate. If commercial account, whole building TOU rate (beginning January 1, 2017 for all customers).

EV Charging Rates
Non-Residential

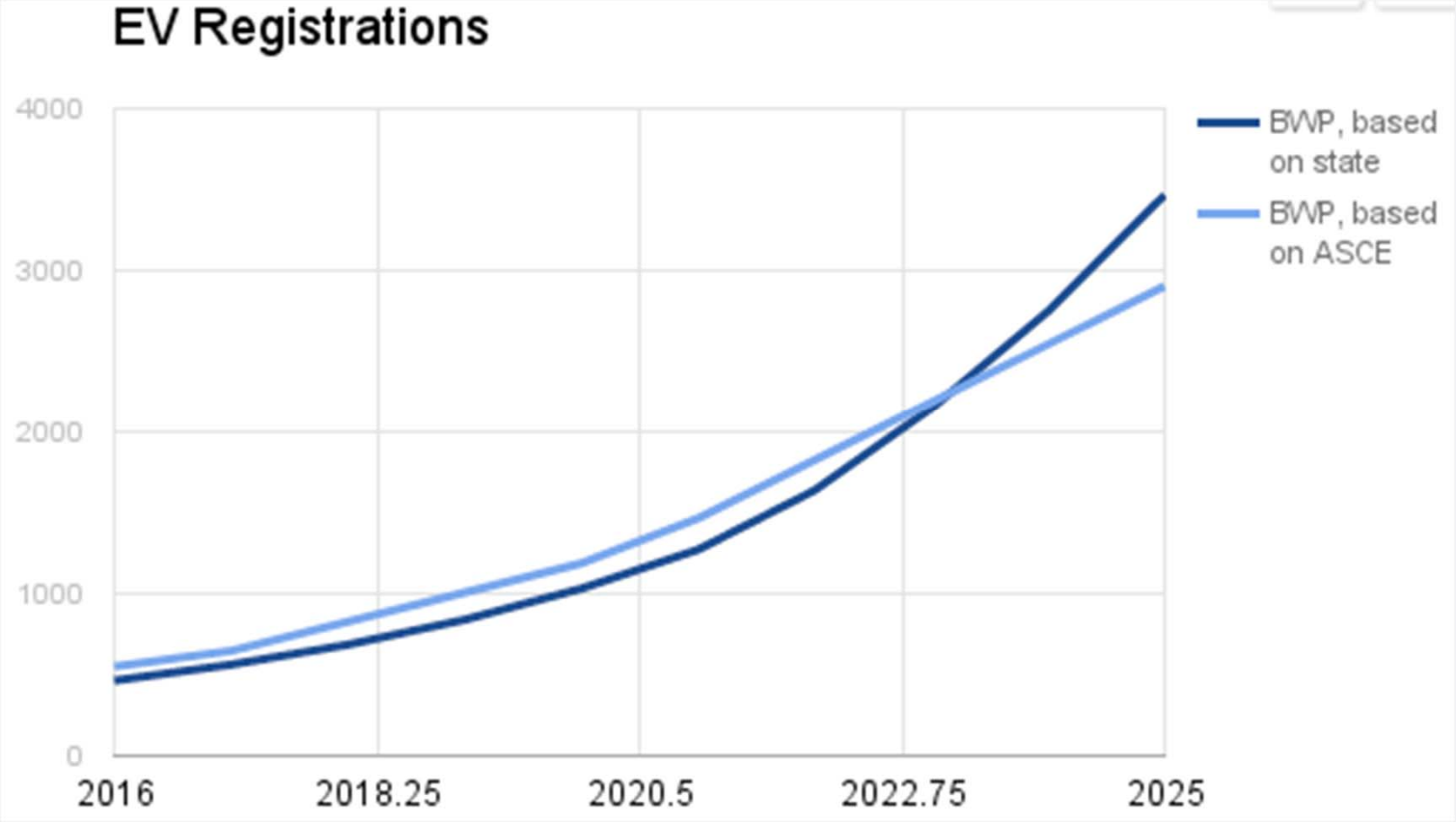
Commercial	If part of existing service / behind customer meter: Class-based TOU rate If separate or BWP service: EV charging rate
Public	EV charging rate (per Citywide Fee Schedule and enforced via Ordinance) Level 2: Summer peak (4pm to 7pm) - 31.17 cents per kWh All other hours - 17.81 cents per kWh Level 3: Summer peak (4pm to 7pm) - 50.58 cents per kWh All other hours - 28.90 cents per kWh

Rates
Analysis

	11pm-8am	8am-4pm	4pm-7pm	7pm-11pm
Residential	$0.08	$0.17	$0.25	$0.17
Commercial	$0.11	$0.13	$0.21	$0.13
Public - Level 2	$0.18	$0.18	$0.31	$0.18
Public - Level 3	$0.29	$0.29	$0.51	$0.29

The following chart is a heat map - green indicating lower prices and red indicating higher prices - of charger pricing, based on type of charger and time of day. The heat maps can also be thought of as a daily load profile - where charging rates are lower when electricity supply exceeds demand.

EV
Forecast



Both forecasts show a doubling of total EVs in Burbank over the next five years, with at least a six-fold increase by 2025.

EV
Budget

	FY 15-16	FY 16-17	FY 17-18	FY 18-19	FY 19-20
Residential Rebates	$25,000	$50,000			
Commercial Rebates	$25,000	$50,000			
Public Charging	$200,000	$184,000			
Public/Private Infrastructure	$0	$100,000			
Grants (CEC)	$215,000	$0			
Total	$465,000	$384,000	TBD	TBD	TBD

BWP will continue to rely on creativity and a variety of funding sources for EV infrastructure and transportation electrification.

Charging Partners

Chargepoint

- Original Equipment Manufacturer (OEM).
- Can be installed behind the meter, with customer ownership and maintenance, or as a utility-owned public charger.
- BWP partner since 2011.
- 11 Level 2 parking lot chargers.

Greenlots

- Agnostic equipment provider.
- Typically installed as a utility-sponsored charger.
- BWP partner through SCPPA since 2015.
- 16 (8 dual) Level 2 curbside chargers.
- 1 Level 3 DCFC.

Charging
Partners – new!

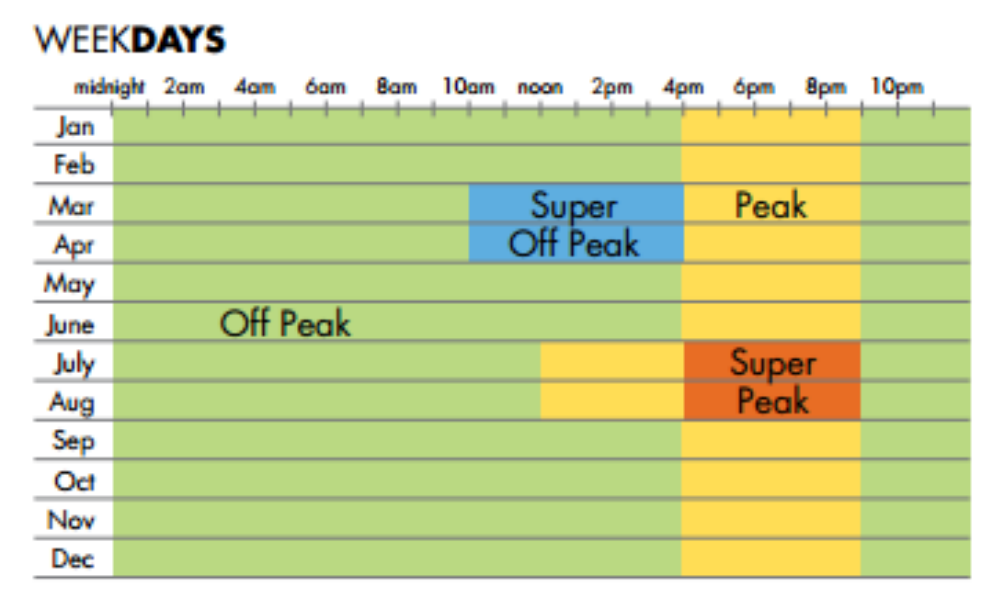
Hollywood Burbank Airport

- 6 Level 2 parking lot chargers located in valet area - $5 on top of valet parking fees.
- Project management by BWP.
- Designed and installed by Greenlots.
- Maintained by Airport Authority.
- All done at a cost of $4,200 per charger.

BWP
Next Steps

Overall EV Program

- Monitor residential, including charger usage, and market patterns and trends.
- Continue to utilize multiple funding sources, including additional funding to fill the gaps – such as for public chargers.
- Survey and promotion of MUD and Workplace charging.



thank you.