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LADWP's Distributed Energy Resource Planning & Programs

CEC IEPR WORKSHOP

Distributed Energy Resources

June 29, 2017

Putting Customers First   

Presentation Overview

LADWP's Integrated Resource Plan (IRP) Overview

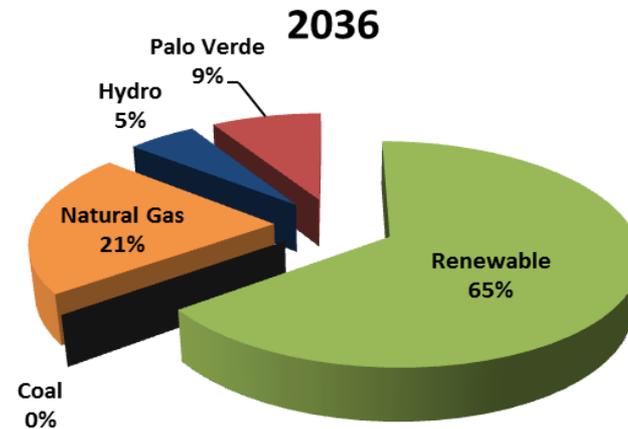
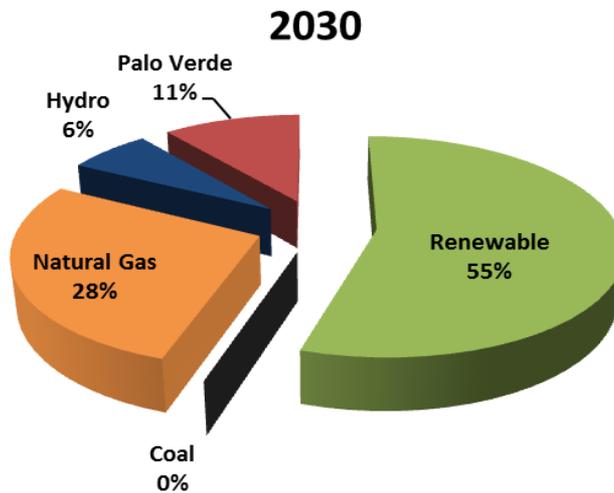
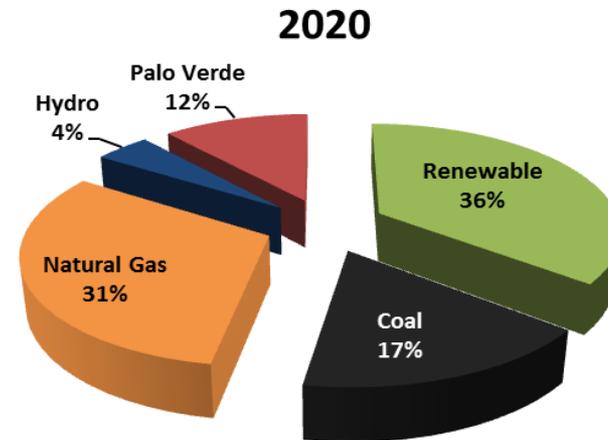
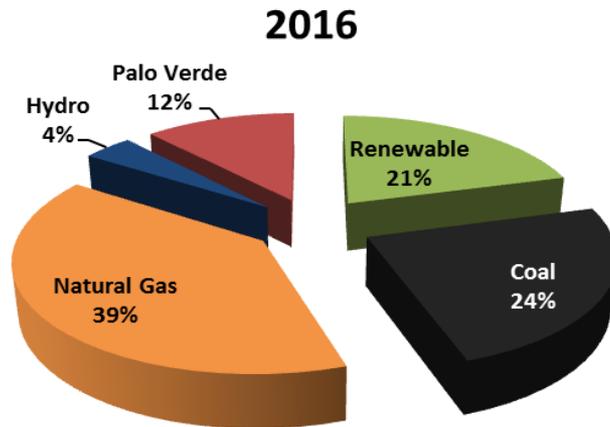
DER System Studies & Research

- Maximum Distributed Renewable Energy Penetration Study
- Distributed Energy Resource Integration Study

LADWP's Distributed Energy Resource (DER) Programs

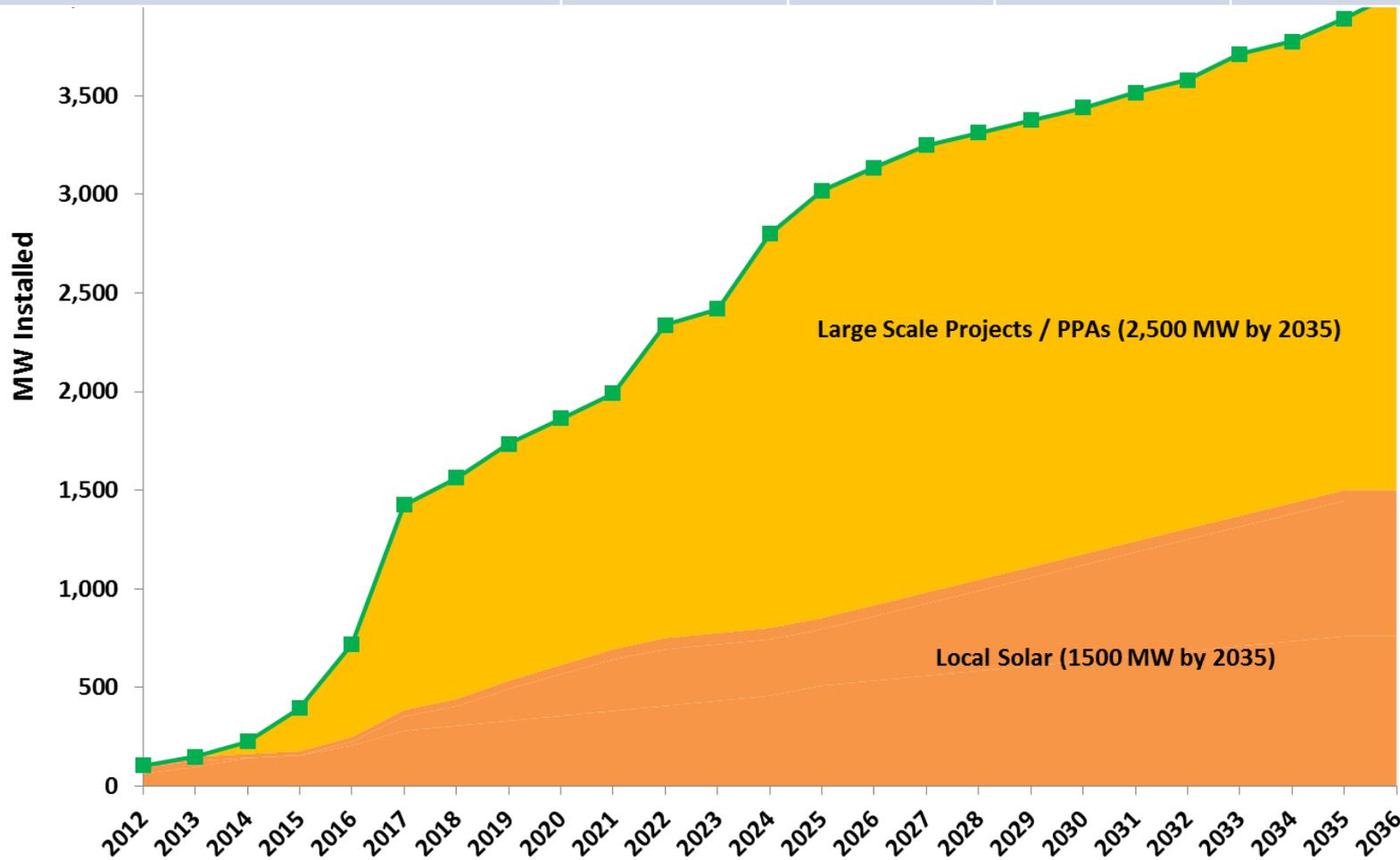
- Distributed Solar
- Energy Storage
- Demand Response
- Electric Vehicle Program and Electrification
- Energy Efficiency

LADWP's Energy Transformation



Solar Programs (1500 MW Dist Solar by 2036)

Recommended Case (2035)	Customer Net Metered	Feed-in Tariff	Utility Built & Community Solar	Large Scale PPA	Total
65% RPS, 15% EE, Medium Local Solar, High Energy Storage, High Electrification	760 MW	700 MW	40 MW	2,500 MW	4,000 MW



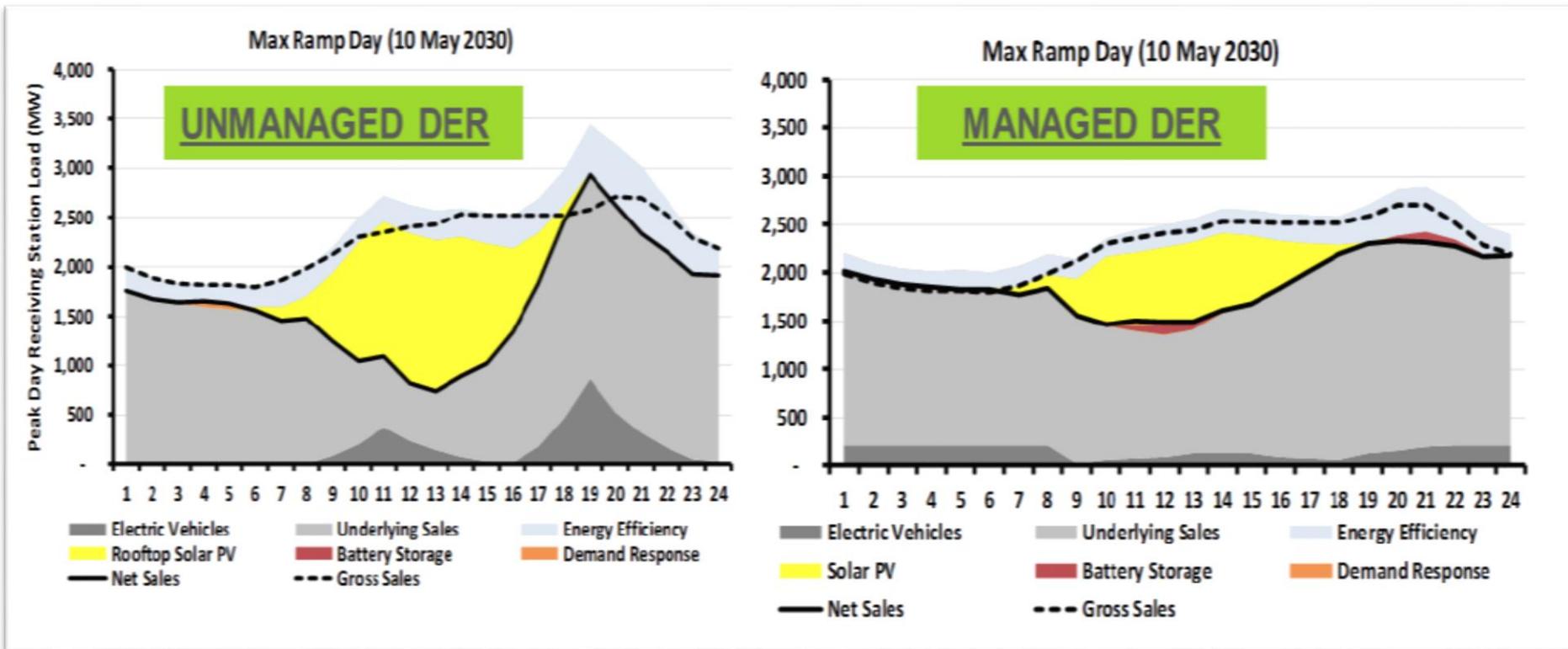
Maximum Distribution Renewable Energy Penetration Study (MDREPS)

Scope: Studied impact of high PV penetration to existing distribution circuits including: voltage fluctuation, reverse power flow, equipment/conductor overload, power factor degradation, phase imbalance, total harmonic distortion. Completed 2016.

Findings:

- Without a managed interconnection process Distributed PV generation will impact LADWP generation and distribution system reliability
- System impacts will vary seasonally, and will occur most during mild weather low-load, high-solar conditions resulting in over-generation
- At the distribution level with rooftop and carport solar, over-gen cannot be curtailed or exported back to the high-voltage transmission system, resulting in problems mentioned previously
- Mitigation measures such as increased deployment of voltage regulation can limit the impacts and actually increase penetration limits on certain circuits/feeders

Distributed Energy Resources Integration Study (DERIS)



Distributed Energy Resources Integration Study (DERIS)

LADWP conducted a Distributed Energy Resources Integration Study with the following goals and objectives:

- Provide a Comprehensive Overview of DER Technologies and Maturity
- Review and Assess Transmission and Distribution System Planning
- Review, Assess, and Synchronize Existing DER Programs
- Perform a DER Integration Analyses
- DER Management and Smart Grid Assessment
- Review, Assess, and Revised Existing DER Incentive Programs
- Provide a DER Integration Planning and Final Training

Study is nearing completion and LADWP has begun to implement changes consistent with preliminary findings.

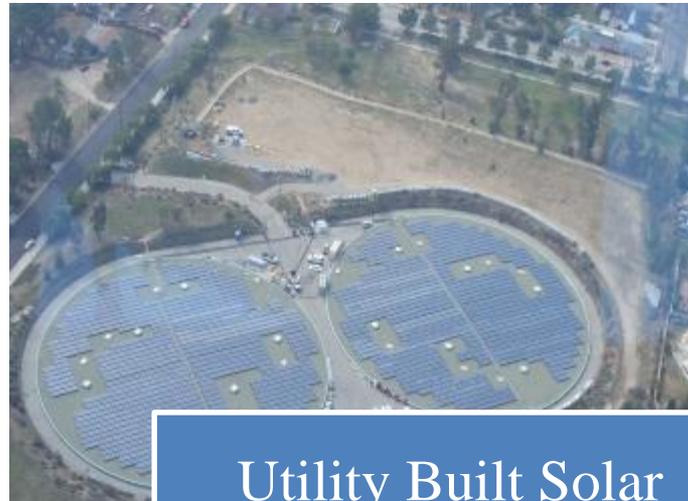
LADWP's Solar Programs



Solar Incentive Program



Feed-in Tariff



Utility Built Solar



Community Solar Program

Solar Incentive Program (SIP)

History

- Adopted \$288M incentive program in 2007 under SB 1
- Originally set incentive levels at \$0.70 to \$1.70/watt higher than minimum to encourage adoption
- Announced 5% of non-coincident peak methodology in 2015
- Continued incentives beyond 10-year period into 2017

Status

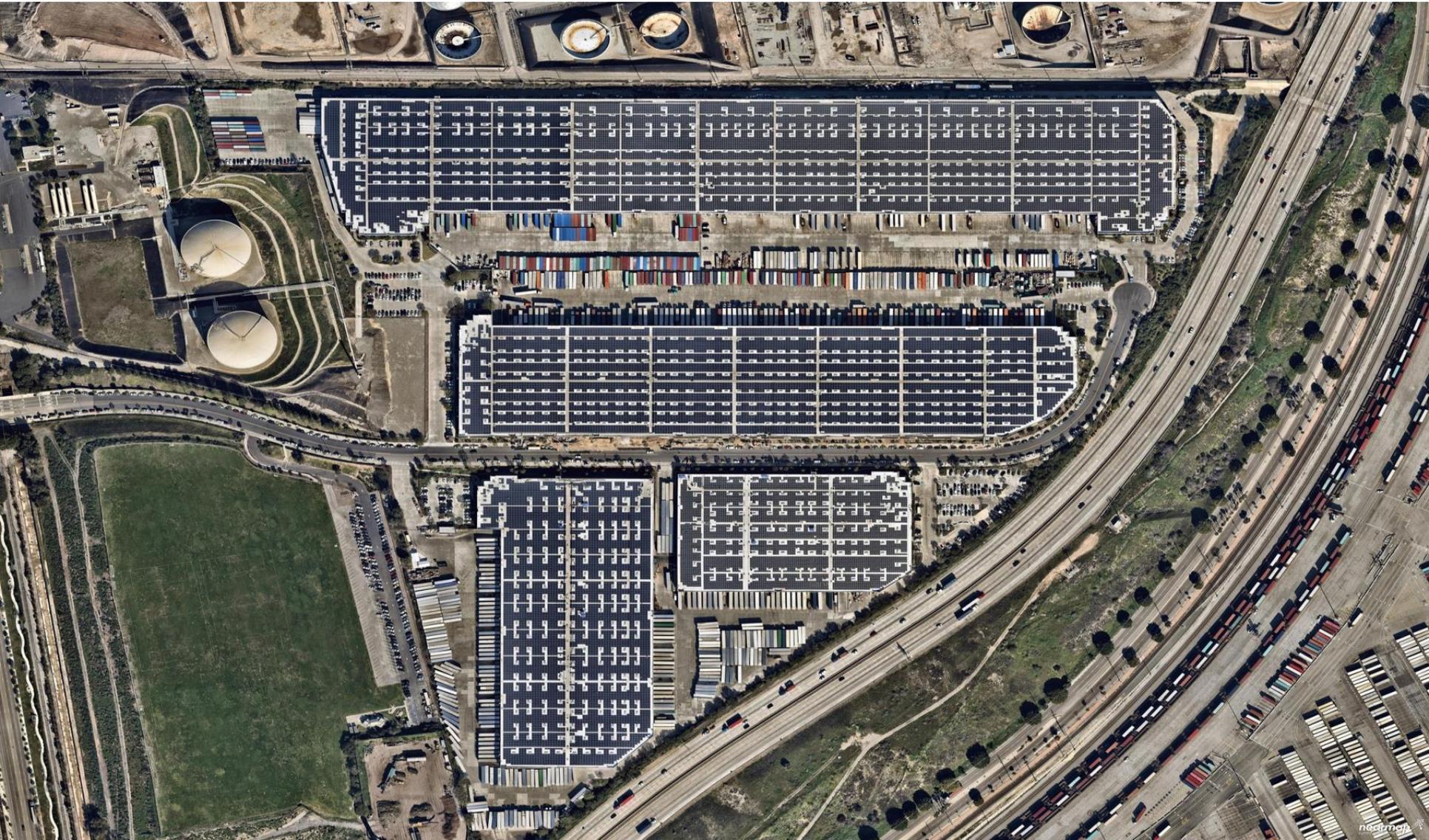
- \$305 million paid to date (includes pre-SB1 incentive program)
- \$12 million of incentives remain; expected to last approximately through 2017, possibly into 2018
- Over 27,000 LADWP customers have participated totaling 214 MW of net metered solar capacity

Feed-in Tariff (FiT)

- LADWP buys 100% of primarily solar energy through 20-year PPA
- SB 1332 requires offering minimum 75 MW; LADWP adopted 150 MW program
- **Set Price:** FiT100 was launched in 5 allocations between February 2013 and February 2015 ranging from \$0.17/kWh to \$0.13/kWh.
- **Competitive Bid:** June 2014, Board approved the FiT 50 as part of the second component of the 150 MW program (\$0.117/kWh to \$0.135/kWh)
- 36.2 MW in-service, 32.9 MW under development
- Remaining capacity to be made available on 6/30/2017

Feed-in Tariff

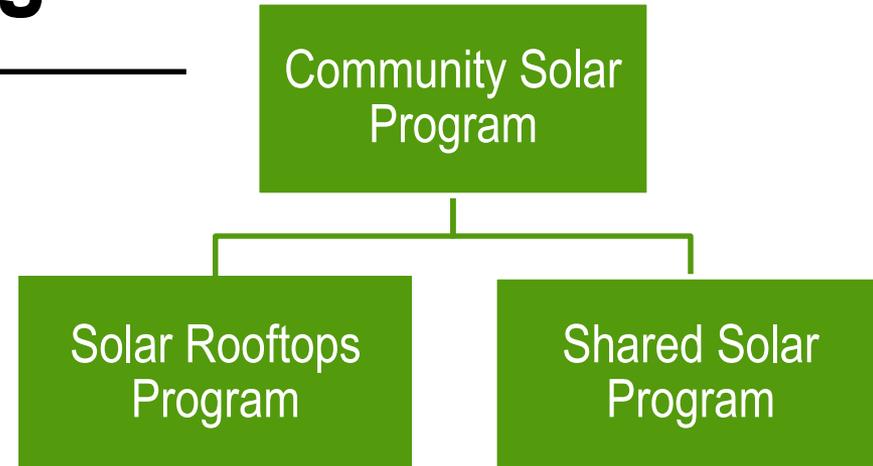
Westmont Solar Project – 15 MW AC



Community Solar Program

Solar Rooftops Program Pilot

- LADWP will install a 2-4 kW solar system on 1,000 rooftops
- Customer receives \$360 per year
- Launched early 2017, first agreement executed in June



Shared Solar Program

- Opportunity for customers unable to participate in net metering, including renters and condo owners
- Participants can subscribe to “blocks” of energy
- Expected program launch in early 2018

Energy Storage

Objective: To deploy energy storage for the purpose of integrating variable energy resources and other system needs in compliance with AB2514

Target:

- 44 MW at distribution level
- 178 MW total by 2021

Status:

- 1.25 MW Thermal Energy Storage complete at LAX
- 21 MW Pumped Hydro complete at Castaic from Upgrades
- 22.57 MW ES completed by 2016
- Several Distributed Energy Storage Projects at various facilities and substations are in the planning stage

Fire Station 28 Solar + Storage Pilot

Objective: Provide resilient power to a critical public safety City facility

Location: Porter Ranch

Battery:

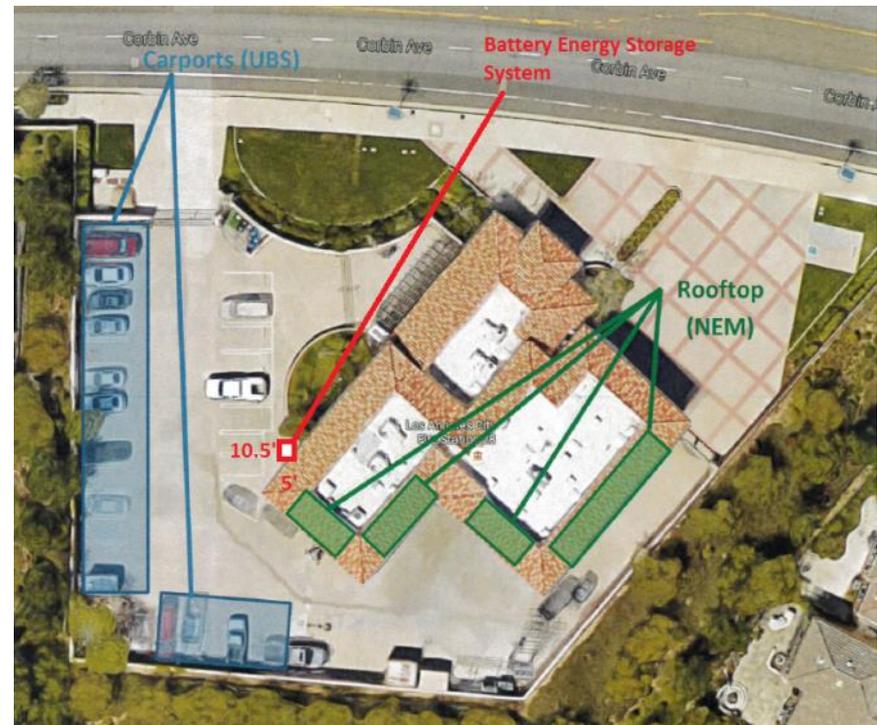
- 12kW, 39kWh
- Backup, Load Shifting, DR

Solar:

- Net Metered Rooftop – 6 kW
- Grid Connected Carport – 46 kW

Schedule:

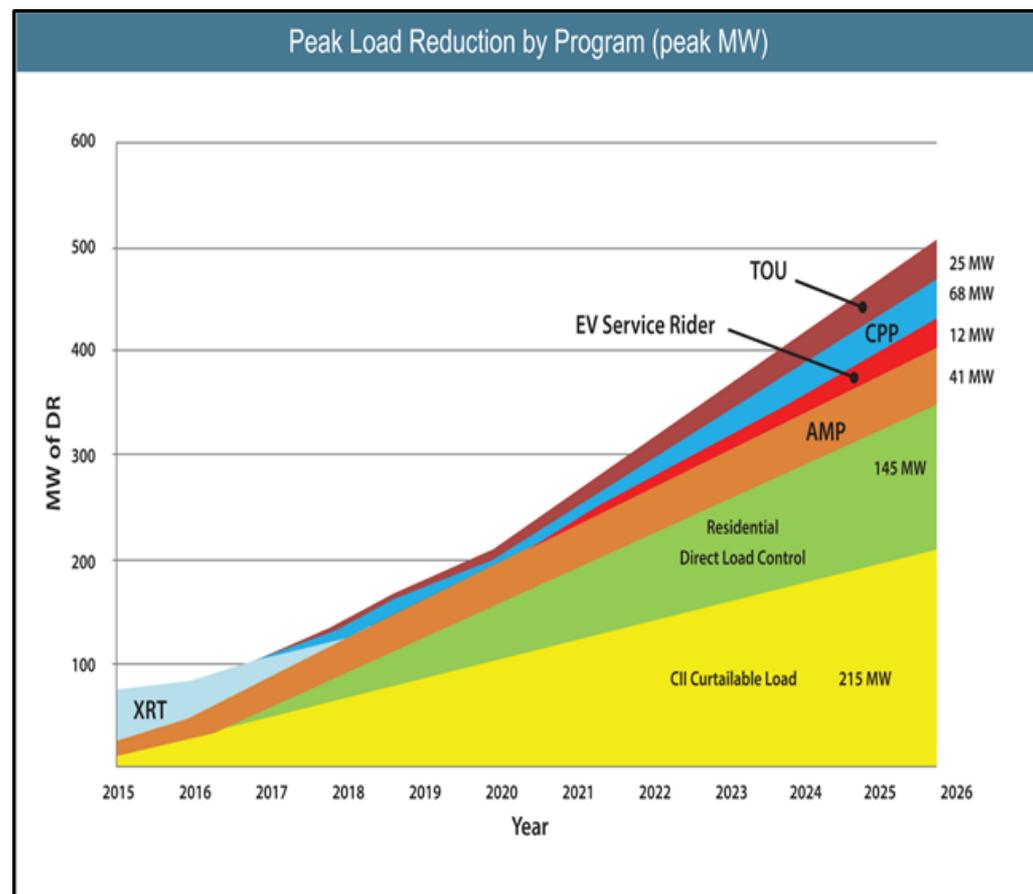
- Solar + Battery – November 17
- Carport – February 18



Staff currently evaluating feasibility of additional critical City facilities

Demand Response

- June 2014 completed the DR Implementation Plan
- Plan for 500 MW by 2026
- June 2015 launched Commercial & Industrial program
- Developing residential thermostat program pilot to launch summer 2018
- Launched “SummerShift” program in 2016 with 100 MW of C&I load shift



LADWP's 5 Year LA EV Infrastructure Plan

5 Year Goal: The equivalent of 145,000 Electric Vehicles in LA

Strategy:

1. Increase EV adoption to 15% of vehicle purchases
2. Count Public and Workplace Chargers as EV equivalent
3. Consider non-light duty as EV equivalent (i.e. Medium & Heavy Duty)
4. Continue offering residential (\$500) and commercial charger (\$4,000) rebates
5. Provide discounted off-peak rates to customers who install dedicated meters
6. Continue direct charger install program at DWP and City of LA Facilities



1st US Utility Pole EV Charger



Annual EE Budget and Goals

2010 – 2020*

Fiscal Year	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20
Budget (millions)	\$49.5	\$37.3	\$50	\$78	\$79	\$73	\$168	\$178	\$180	\$163
GWh Savings	265	228	319	337	343	412	394	412	396	359

Actuals

Current Year
Plan

Future
Planned**

* Estimated cumulative GWh savings through FY15-16 are 13% ahead of schedule for the 10-yr plan

** Savings and estimated budgets based on the 2014 LADWP EE Potential Study. 2017 update underway.

Thank You

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Integrated Resource Planning

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Distributed Energy Resource Program Office