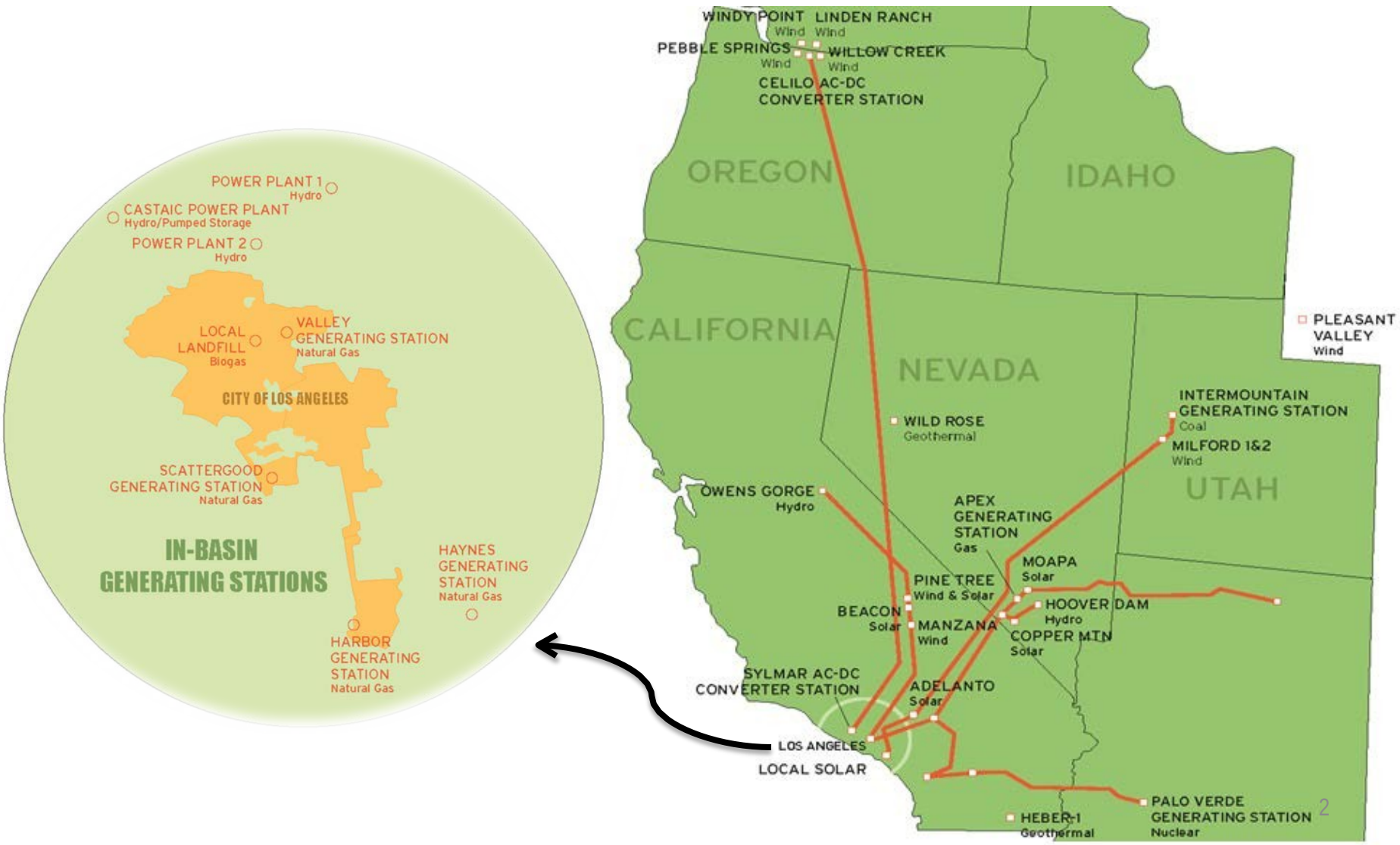
Heat Islands and Susceptible Communities

Nancy Sutley, Chief Sustainability Officer
Los Angeles Department of Water and Power
NAS Workshop, Washington, DC
August 14, 2018

LADWP is the Nation's Largest Municipally Owned Utility



GHG Emission Reduction Goals Drive Investments and Programs

- AB 32 (2006)
  - Reduces statewide emissions to 1990 levels by 2020
- SB 1368 (2006)
  - Restricts long-term investments in baseload generation for coal power plants
- SB 350 (2015)
  - Increases renewable electricity goal from 33% by 2020 to 50% by 2030
  - Establishes targets to achieve doubling of energy efficiency by 2030.
- SB 32 (2016)
  - Reduces statewide emissions to 40% below 1990 levels by 2030
- AB 398 (2017)
  - Continues cap and trade program through 2030
- LA Mayor Garcetti pledges that LA will be carbon neutral by 2050

LADWP's GHG emissions are 42% below 1990 levels

LADWP Cumulative GHG Reductions through 2030

Program Revenue Requirement	Cumulative GHG Reduction from 2017 – 2030 (million metric ton)	Percent of Cumulative Reductions (%)
Early IPP Replacement	5.09	31
Increase RPS from 50% to 55%	3.24	20
Increase Energy Efficiency form 2xEE to Advanced EE	1.01	6
Increase Local Solar from 1000 MW to 1600 MW	0.93	6
Increase Energy Storage from 178 MW to 404 MW	0.76	4
Increase Transportation Electrification from Base (290,000 EV equivalents by 2030) to High (580,000)	5.30*	33

**From 2017 IRP runs to 2030. GHG emissions savings estimated with CEC/CARB Light Duty Plug-In EV Energy and Emission Calculator version 3.5*

LA Must Prepare to Deal with Impacts of Climate Change, Particularly Extreme Heat

- Climate change will impact City of LA and LADWP. Potential impacts to LADWP include:
  - Sea level rise
  - Hydrological changes, including increased frequency/duration of drought
  - Increased risk of wildfires
  - Extreme heat
- City of Los Angeles is highly urbanized and paved, magnifying impacts of extreme heat. LA has many vulnerable communities, including physically vulnerable people and neighborhoods with high poverty levels.
- Extreme heat can affect communities by increasing warm weather peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality, and water quality.
- According to recent modeling done by Dr. Alex Hall at UCLA, the number of extreme heat days (over 95 degree temperatures) in LA are expected to increase two-to-four fold by mid-century.

LADWP Plays a Role in Addressing Urban Heat Island Effect in Los Angeles

- Coordinated with Sustainable City pLAn and LA Resilience plan.
- LADWP is a key member of the City Council designated Committee on Cooling and Urban Heat Impacts, comprised of relevant City departments and experts in the field.
- Energy efficiency often coincides with beneficial impacts on the urban heat island effect. Building efficiency measures aim to protect structures from heat gain (and loss in cooler climates), which reduces the waste heat associated with air conditioning (or heating) buildings.
- LADWP is involved in all three key mitigation areas of the urban heat island effect: cool roofs, canopy cover, and cool pavements.

LADWP Working to Encourage Cool Roofs and Other Building Measures

- Cool Roofs
  - LADWP offers incentives for cool roofs:
    - Residential rebates offered since 2010. 2,200 roofs, incentivizing over 7 million sq. ft. and resulting in over 1.5 GWh energy savings per year.
    - Title 24 requires cool roofs for commercial buildings. LADWP offers rebate to encourage more aggressive adoptions
  - LA City Ordinance effective 2015. 18,000 permitted cool roofs have been installed to date, covering over 25 million sq.ft., and resulting in over 3.6 GWh per year of energy savings.

- Attic Insulation
  - LADWP developing $20 million in additional incentives for energy savings aimed primarily at low-income and multi-family customers.
  - Will include new incentives for attic insulation including rebates and direct installation.

City of LA Moving to Expand Cool Pavement

- LA's predominantly dark hot asphalt pavements cover over 40% of the City's built environment. Currently, the vast majority of pavements in the City have minimal solar reflectance.

- Bureau of Street Services (BSS) ran a successful pilot program featuring one cool street in each of the 15 Council Districts. LADWP continues to coordinate with BSS and will participate in proposed neighborhood scale projects.

Increasing Tree Canopy Cover in LA is a Key Strategy

- For several decades, LADWP has run/funded tree planting programs in LA to achieve energy savings.

- LADWP now funds the City Plants (city run program) to provide and plant about 22,000 new trees per year. This funding prioritizes trees that will shade buildings and reduce air conditioning use and focuses on low canopy areas.

- City Plants distributes free trees to residents and businesses in three ways: yard tree adoption events (1 tree per adopting household), yard tree home deliveries (up to 7 trees per home), and street trees in parkways.

- LADWP has directed City Plants in adopting a comprehensive energy tracking system, based on the U.S. Forest Service's Eco Smart Landscapes model. This model includes energy saving calculations for the indirect area cooling effects of trees beyond their direct shading of buildings. In the past year, this ambient cooling saved an estimated 1.5 GWh of the approximately 6 GWh total energy savings from LADWP-funded trees.

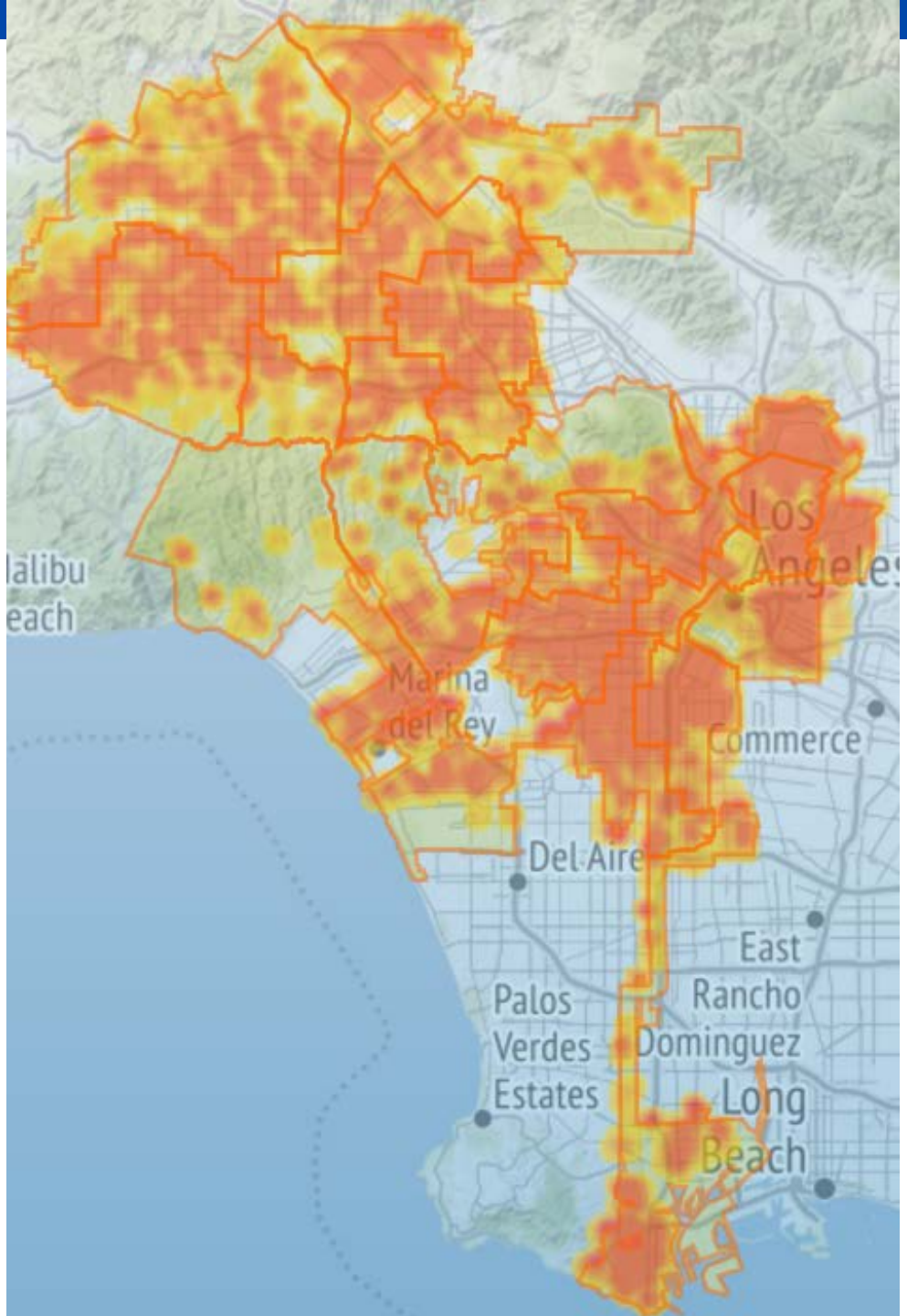
What are Equity Metrics?

Equity metrics are data that assess how well programs, services, resources, and investments are distributed and used across our customer base of about 4 million people.

Equity Metrics Tracked

Equity Core Category	Metric
Water & Power Infrastructure Investment	1. Water Quality Complaints 2. Water System Probability of Failure & Planned Replacements 3. SAIDI (Outage Duration) & SAIFI (Outage Frequency) 4. Power System Reliability Program (PSRP) – Pole, Transformer, Cable Replacements
Customer Incentive Programs/Services	5. Rain Barrel/Cistern/Water Tank Rebates 6. Turf Removal Rebates 7. Tree Canopy Program 8. Commercial Direct Install Program 9. Home Energy Improvement Program 10. Refrigerator Exchange Program 11. Consumer Rebate Program 12. Electric Vehicle Infrastructure 13. Low Income & Lifeline Programs
Procurement	14. Small Business Enterprise/Disabled Veteran Business Enterprise Program
Employment	15. New Hire/Promotion Demographics

Using data, we can determine where to plant trees and target our communities lacking adequate canopy cover.



Accomplishments

City Plants distributed/ planted 78,526 trees saving nearly 21 GWh of energy in just over 3 years

Potential Areas for Additional Research

- How to establish near-term and long-term cooling targets.
- Increasing understanding of distribution and impacts on neighborhoods and communities.
- New technologies/strategies to address urban heat island.