Revised 10/9/23

L.A.’s Clean Energy Future

Powered by Equity

LA DWP

NREL
Transforming ENERGY

UCLA

LADWP Is Leading the Way in Creating a Clean and Equitable Energy Transition

LA100

Study by **NREL**

Goal: Model a path to a 100% clean and renewable energy system in LA

Urgent Critical Juncture

To achieve 100% clean energy will require investing $57 - $87 billion.

We need widespread customer participation to successfully reach this goal.

Yet those who have been harmed the most from past injustices will bear a greater burden unless we address historical inequities.

Historical Inequities

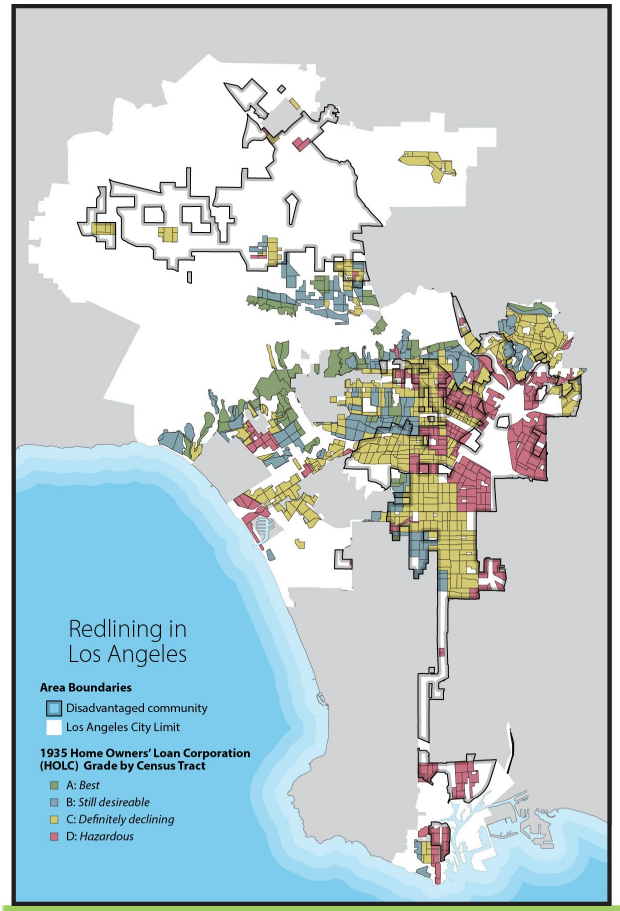
Historical housing inequities

- Redlining
- Higher densities
- Housing covenants

Higher exposure to environmental hazards (industry, emissions, high heat)

Less access to transit

Redlining and Current Demographics



"Grade"	Percent of DAC Tracts in HOLC Grades	2019 Demographics in 1935 HOLC-Graded Tracts:				Median Household Income ($/year)*
		White*	Non-White*	Hispanic*	Home-Owners*	
A *"Best"*	0.25	8.77	3.12	1.43	11.06	127,581
B *"Still desirable"*	3.96	14.54	10.09	5.18	18.39	82,448
C *"Definitely Declining"*	47.03	45.18	50.65	48.19	45.89	54,889
D *"Hazardous"*	48.76	31.50	36.14	45.20	24.67	48,560

Low "Mortgage Risk" High

Source: 2019 American Community Survey.

Housing and lending practices of the past influence current-day distribution of disadvantaged communities (DAC)** and income inequality.

**DAC defined here as census tracts with the highest 25% CalEnviroScreen 4.0 Scores. See Appendix for details. Source: CalEnviroScreen 4.0 October 2021.

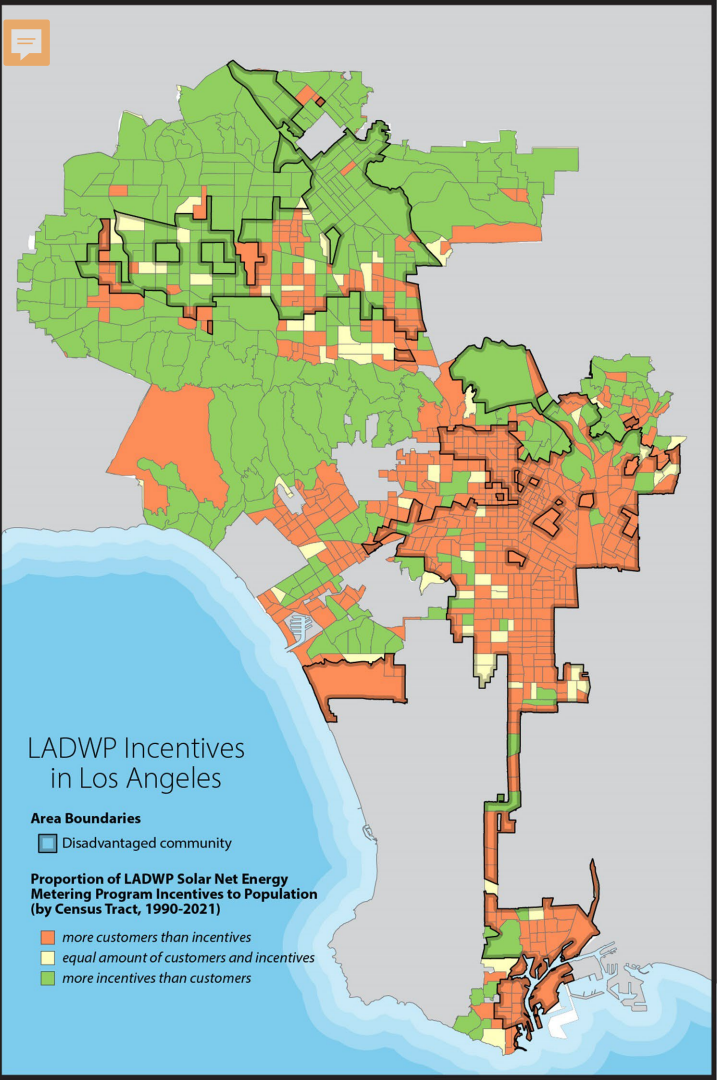
And there is more

Redlining has meant that there is more density in historically redlined communities

They tend to be located in parts of Los Angeles that are hotter and can be subject to more flooding

Because there has been less new development, historically, infrastructure has not been as often upgraded

- Electrical distribution grid
- Storm water
- Street improvements



LADWP's energy transformation has also contributed to inequity

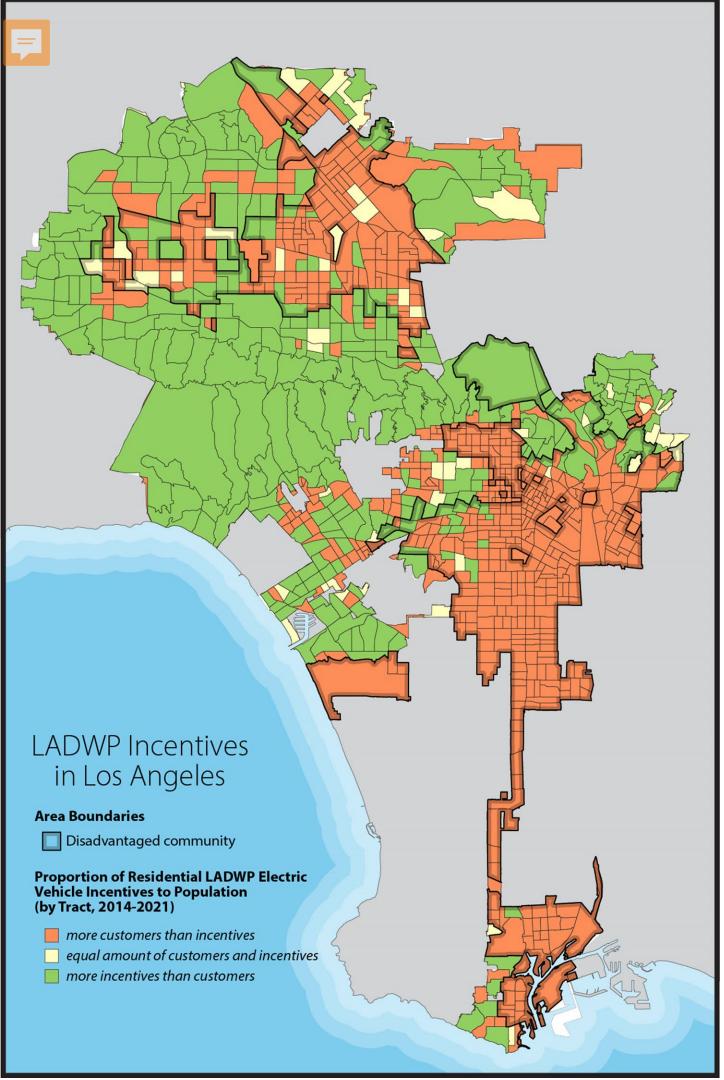
Solar Net Metering Incentives

From 1999-2022:

- $340 Million Invested
- 38% spent in underserved communities

Areas including South LA and the Harbor did not receive solar incentives proportional to their populations.*

*Baseline Solar Equity Analysis by Jane Lockshin, NREL, March 29, 2023



Electric Vehicles and Charger Rebates

From 2013-2021:

- $5.4 Million Invested
- 23% spent in underserved communities

Areas including South LA and the and the San Fernando Valley did not receive EV and EV charging infrastructure incentives proportional to their populations.*

*Transportation Electrification presentation, NREL, Feb. 15, 2023

Challenges Ahead

Inequitable Rate Structure

- Transforming our power supply will be costly and the energy burden will fall hardest on lower income customers
- Our current rate structure is constrained by state law. California Propositions 218 and 26 treat municipal utility rates as taxes and prevent rate increases unless approved by voters. These also prohibit expanding low-income assistance programs.
- Achieving equitable rates requires a City Charter change.

Heat

- 230,000 low-income households lack cooling
- >50% low-income households will see indoor temps over 95F each year by 2035

Challenges Ahead

Program Inequities

- Less than half (46%) of spending on energy efficiency benefits historically underserved communities
- Solar (38%)
- EV infrastructure (23%)

Funding

- Federal funding is limited, would cover upgrades for <1% of low- and moderate-income households

LADWP is committed to achieving a clean energy future in which all of our customers benefit and no one is left behind.

LADWP Is Leading the Way in Creating a Clean and Equitable Energy Transition

LA100 Equity Strategies

Study by **NREL** and **UCLA**

Goal: Center equity in LA's clean energy transition

LA100

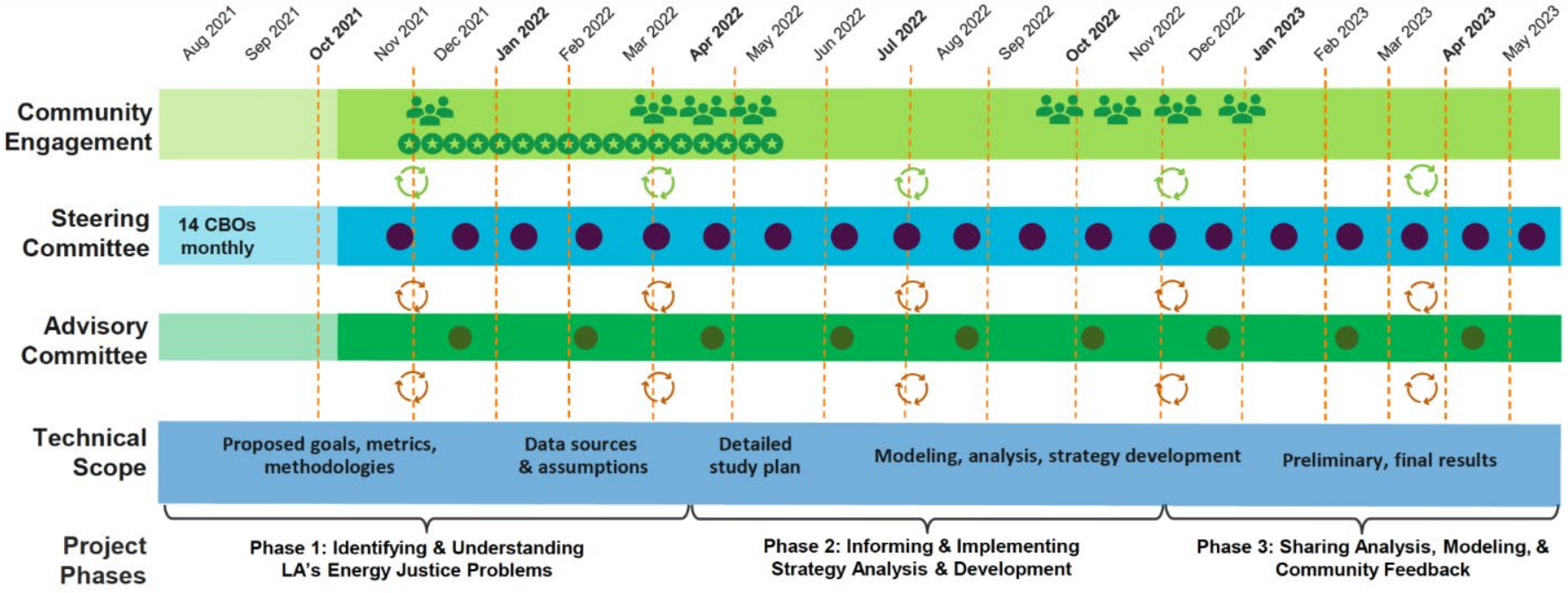
Study by **NREL**

Goal: Model a path to a 100% clean and renewable energy system in LA

LA100 Equity Strategies Was Community-Driven

- Unprecedented 2-year public engagement and research effort
- Independent study and analysis led by NREL and UCLA
- Guided by a Steering Committee
  - 14 LA Community-based organizations active in energy and environmental justice
  - 18 monthly meetings
- 15 “listening sessions” with 150 community members
- Advisory Committee as a resource to the research effort
  - 31 LA agencies, labor, environmental groups
  - 8 bi-monthly meetings

Equity Strategies Detailed Timeline



Legend

Key connections
- Feedback loops

Engagement
- Community Engagement
- Steering Committee
- Advisory Committee

Meetings
- Steering Committee
- Advisory Committee

Interviews
- One on One
- Listening Sessions

Five Community-Identified Priorities

- Affordability and energy burdens
- Access to and use of energy technologies, programs, and infrastructure
- Health, safety, and community resilience
- Jobs and workforce development
- Inclusive community involvement

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NREL's Approach & Contributions to LA100 Equity Strategies

Kate Anderson
National Renewable Energy Laboratory

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NREL Team

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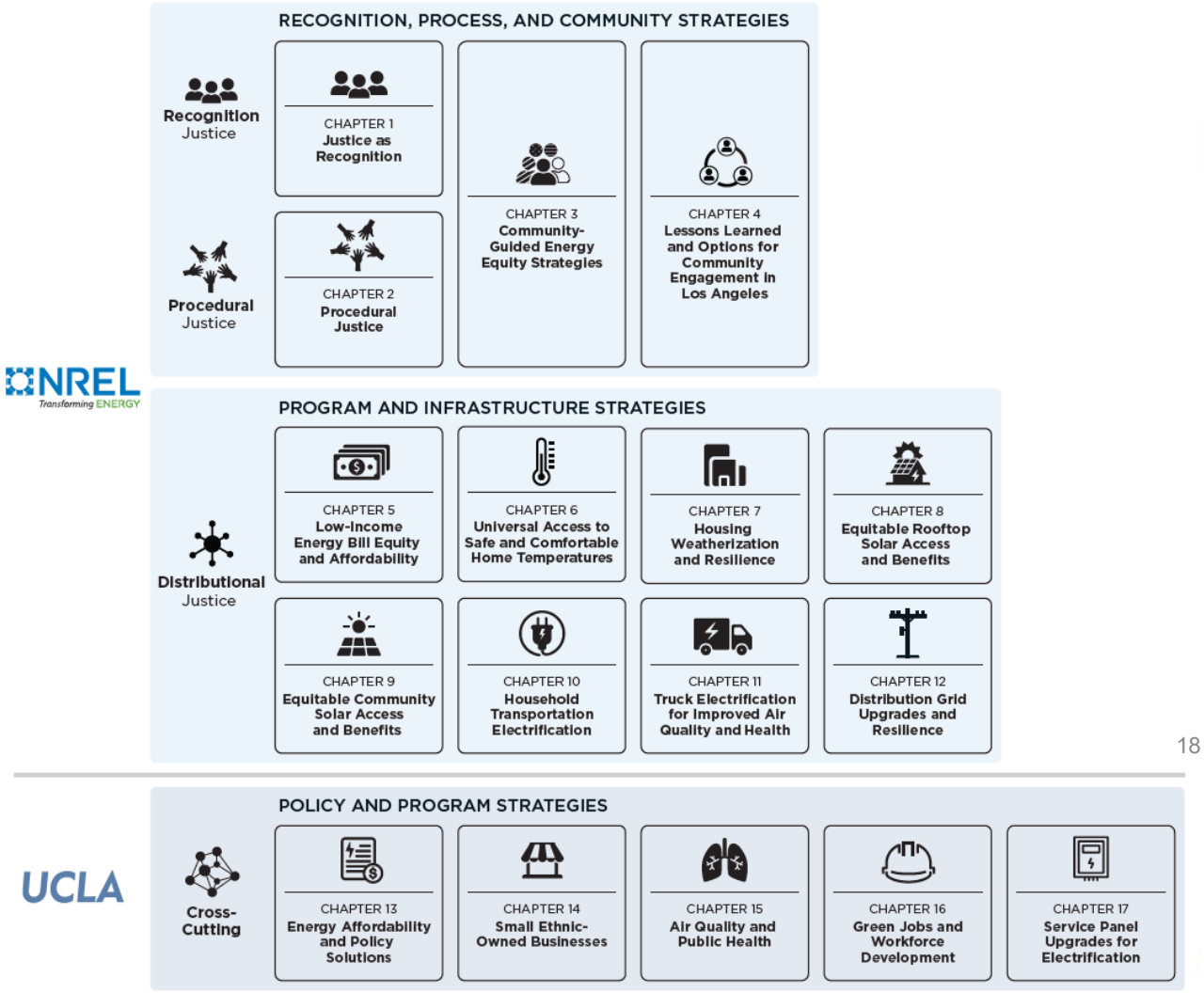
Senior Environmental Scientist

Dr. Bryan Palmintier
Group Manager and
Principal Engineer

Study Overview



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Community- and Data-Informed Strategies

NREL analysis included input from:

- **100+ community members**
- **14 community-based organizations**
- **19 Steering Committee meetings**
- **9 Advisory Committee meetings**
- **32 city and nonprofit agencies**

NREL **modeled business-as-usual and multiple equity scenarios** for:

- Energy bill affordability and equity
- Access to safe home temperatures
- Solar bill savings
- EV adoption and charging access
- E-bike & shared EV time & cost savings
- Truck electrification air quality and health benefits
- Grid reliability and resilience

Impacts analyzed by **equity metrics** including:

- Disadvantaged community status
- Income
- Homeowner/renter status
- Housing type (multifamily, single-family)
- Neighborhood
- Pollution exposure

For example, in housing, NREL modeled **hourly electricity and gas usage** for:

- **50,000 representative households**
- Across **100** household and building characteristics
- Representing diversity of **1.57 million LADWP customers**

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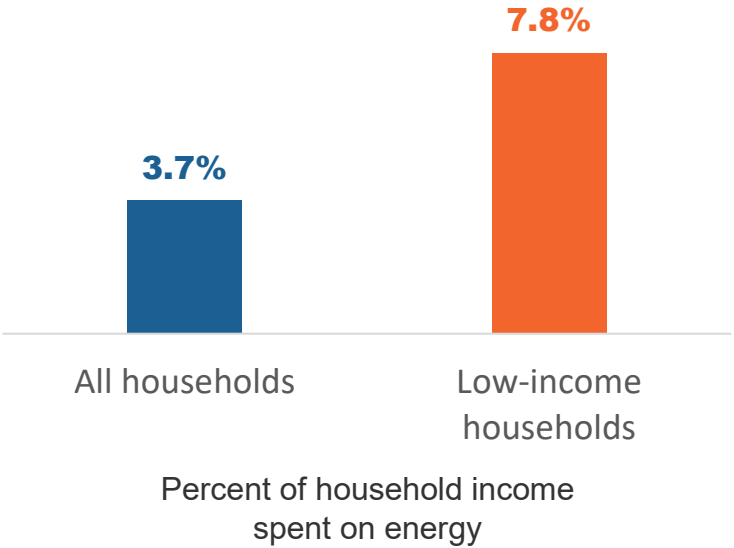
Energy Bill Affordability and Equity

Thomas Bowen, NREL

Christina Simeone, NREL

Affordability: Where we are today

- 13% of Los Angeles households are energy-burdened and extremely low-income
- LADWP has low enrollment in bill assistance programs (7% of residential customers in 2019) and low bill discounts ($8/month in 2019)
- Continuation of the existing rate approach will increase electricity bills more for low-income customers than all customers
- Current laws restrict LADWP's ability to reform rates and increase low-income assistance.



Affordability Strategies

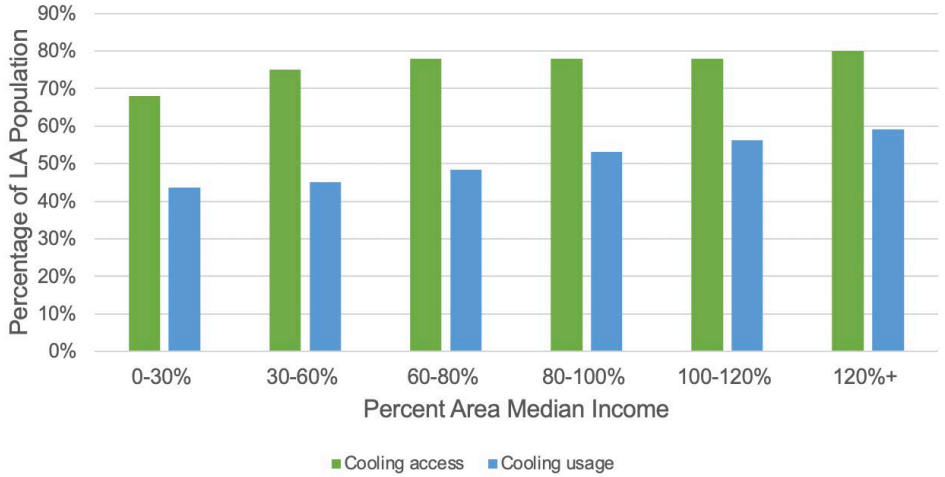
	Policy	Program
Implement simplified tiered or time-of-use rates, replace solar net metering with net billing • Low-income monthly bills decrease $14-$15/month • Bill disparity between solar adopters and non-adopters decreases from $162/month to $55-$65/month.	✓	
Implement robust low-income assistance programs Reduces low-income bills 22% in 2035 compared to business-as-usual rates and increases the number of households receiving assistance by more than 250,000.	✓	
Implement low-income customer on-bill tariffs for energy efficiency Can reduce energy bills for more than 150,000 low-income customers.		✓
Explore income-based fixed charges Reduces low-income bills 58% and eliminates high electricity burdens for all customers by 2035.	✓	

Housing

Katelyn Stenger, NREL
Philip White, NREL
Noah Sandoval, NREL
Tony Fontanini, NREL
Ry Horsey, NREL

Housing: Where we are today

- Fewer than 50% of low- and moderate-income households use cooling
- More than 30% of extremely low-income households lack access to cooling
- 230,000 low-income households will experience more than two months of exposure to dangerous indoor air temperatures annually by 2035
- Low-income multifamily building renters have highest exposure to dangerous temperatures in an outage.



Housing Strategies

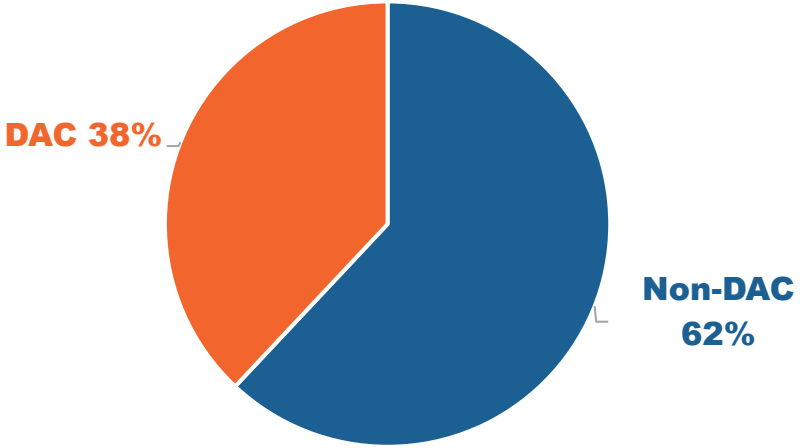
	Policy	Program
Expand direct installation of cooling in extremely low-income households without cooling, prioritizing multifamily buildings Access to cooling is the most effective intervention to reduce exposure to dangerous temperatures for all building types.		✓
Provide heat pump rebates in Cool LA Heat pumps reduce energy bills by providing 29% more energy efficient cooling compared to window AC units; rebates reduce high capital costs.		✓
Mitigate rent increases and displacement from LADWP-supported upgrades Partner with the Housing Authority to provide cooling and weatherization in public housing.		✓

Local Solar

Ashreeta Prasanna, NREL
Ashok Sekar, NREL
Jane Lockshin, NREL
Paritosh Das, NREL

Solar: Where we are today

- 62% of LADWP solar net energy metering incentives went to households in non-disadvantaged communities
- $341M in LADWP solar incentives disproportionately benefited predominantly White, non-Hispanic, homeowning, and wealthier neighborhoods
- The LADWP Shared Solar program has higher participation and subscribed capacity among non-disadvantaged, non-Hispanic, and wealthier communities
- The LADWP Shared Solar program requires a premium payment for enrollment.



Solar net metering incentive allocation
Normalized by number of customers

Solar Strategies

	Policy	Program
Establish a low- and moderate-income Shared Solar subscription rate Increasing max subscription amount to 500 kW/month and lowering the rate to $0.18/kWh reduces LMI annual energy bills by $480/household		✓
Substantially expand Shared Solar capacity and allocate 50% of all new project capacity to low- and moderate-income subscribers Prioritize Shared Solar development at the 1 brownfield, 730 multifamily, 21 recreation centers, and 150 LADWP-owned sites with ≥30 kW economically viable capacity		✓
Develop Shared Solar on economically viable ≥30 kW multifamily sites in low-income tracts to capture the 50% Tax Credit and deliver bill savings LA has 600+ economically viable potential shared solar sites on multifamily properties in low-income tracts totaling 255 MW		✓

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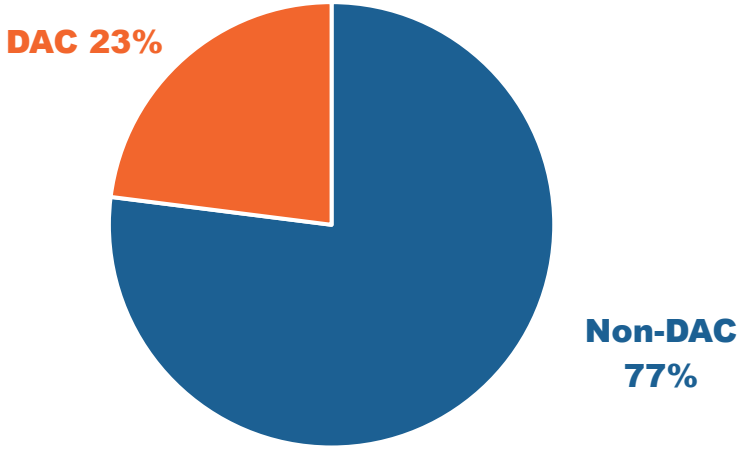
Household Transportation Electrification

Alana Wilson, NREL
Bingrong Sun, NREL
D-Y Lee, NREL

Household Transportation: Where we are today

- 77% of LADWP residential used EV and EV charging incentives went to households in non-DACs
- $5.4M in LADWP EV incentives disproportionately benefited predominantly White, non-Hispanic, homeowning, and wealthier neighborhoods
- Non-Hispanic households have access to more public charging stations near their homes than Hispanic households
- In LA DACs, 16% of households do not own vehicles (versus 12% citywide)



Electric vehicle incentive allocation
Normalized by number of customers

Household Transportation Strategies

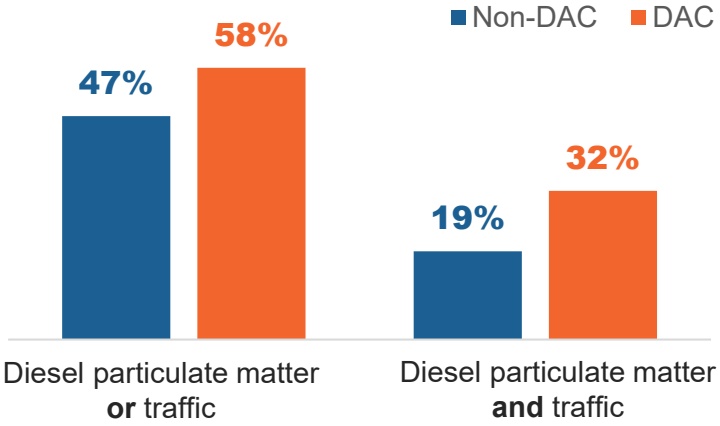
	Policy	Program
Increase LADWP low-income used EV incentive from $2,500 to $4,000, add an eligibility purchase price cap of $25,000 for all rebates, shift to point-of-sale discounts, and establish e-bike and e-scooter rebates Increases used EV adoption among LMI households 50,000 vehicles by 2035 and reduces total household expenditures by about 3%.		✓
Expand at- and near-home light-duty EV charging access for low-income multifamily building residents and include low-voltage charging outlets at charging stations • 50,000 new charging ports provide charging access to the 320,000 EV adopters in DACs projected by 2035 • Low-voltage outlets support e-bike, low-speed vehicle, e-scooter, and older-model EV charging.		✓
Provide vouchers or charging subscriptions for public EV charging to low-income households, especially those without home charging access Public charging costs an average of $300 more per year compared to at-home charging for LMI households.		✓
Establish EV car-share, e-bike, and e-scooter programs in transportation DACs • Provides cost savings of 7% and reductions in travel time of up to 30% • Reduce emissions by 316,000 tons of CO_2e per year (equivalent to taking 62,000 cars off the road).		✓

Truck Electrification for Improved Air Quality and Health

Garvin Heath, NREL
Vikram Ravi, NREL
Yun Li, NREL

Truck Electrification: Where we are today

- DACs have a disproportionately high representation among California's most traffic-affected neighborhoods
- Heavy-duty trucks in LA account for more than 50% of on-road transportation NOx emissions, though they make up only 5% of vehicle population
- Heavy-heavy-duty trucks, such as fire trucks and dump trucks, contribute more than 90% of truck-related NO_2 and 80% of truck-related particulate matter concentration in LA (5x other heavy-duty trucks).



>75 percentile exposure to diesel particulate matter or/and traffic impact

(Source: CalEnviroScreen 4.0)

Truck Electrification Strategies

	Policy	Program
Establish targets, a plan, and a budget for LADWP heavy-duty truck fleet electrification and truck charging infrastructure development, with a carve-out for heavy-heavy-duty trucks Traffic-impacted DACs benefit 25% more from truck electrification than non-DACs.		✓
Collaborate to establish a community-wide 2035 heavy-duty truck electrification target, a target for City-owned truck electrification, and purchase incentives A goal of 28,000 electrified class 3-8 trucks in Los Angeles by 2035 aligns with state policies.		✓
Establish city heavy-duty truck charging infrastructure targets aligned with truck electrification goals, collaborate on siting • 1,900 – 3,300 truck chargers by 2025 • 5,400 – 9,600 truck chargers by 2030 • 14,000 – 24,000 truck chargers by 2035.		✓

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Distribution Grid Upgrades and Resilience

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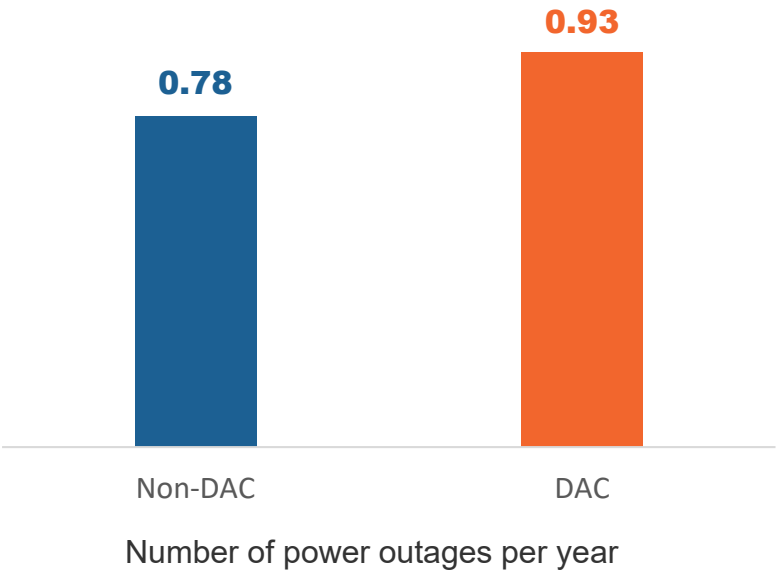
Sherin Ann Abraham, NREL
Kwami Sedzro, NREL
Jane Lockshin, NREL
Gayathri Krishnamoorthy, NREL
Kapil Duwadi, NREL

Grid Upgrades & Resilience: Where we are today

- DAC and mostly Hispanic communities experience more frequent power interruptions than non-DAC and mostly non-Hispanic communities
- 12.6% of distribution lines are underground in DACs compared to 26.7% in non-DACs
- Grid stress is 14% higher in regions of the city with significant DACs than regions with few DACs, and is projected to worsen to 25% higher by 2035
- In modeled disaster events, DACs have lower access to critical electricity-related services such as grocery stores, hospitals, and convenience stores than non-DACs.



Number of power outages per year

Grid Upgrades & Resilience Strategies

	Policy	Program
Incorporate equity as a priority in grid infrastructure investment planning Incorporate income and DAC status to identify areas of inequity.		✓
Upsize transformer capacity by 2–3+ times when replacing service transformers to accommodate electrification and DERs, particularly for those serving customers with low capacity (<125A) service Coordinate grid upgrade programs with cooling, electric vehicle, home electrification, and electric panel upgrades.		✓
Implement community-specific, equitable resilience strategies Prioritize resilient electricity upgrades for critical emergency services in neighborhoods with low service access.		✓

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UCLA's Approach & Contributions to LA100 Equity Strategies

Gregory Pierce
UCLA Luskin Center for Innovation

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UCLA's Approach to LA100 Equity Strategies

UCLA was invited into the Equity Strategies process in December 2021, and started work in early 2022, working to:

- collaborate smoothly within the established framework,
- offer local experience as a customer and stakeholder,
- incorporate a broad range of expertise (engineering, environmental science, law, labor studies, public health, public policy), and
- bring a long-term perspective — **Los Angeles is our home.**

UCLA Team

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Director, UCLA California Center for Sustainable Communities

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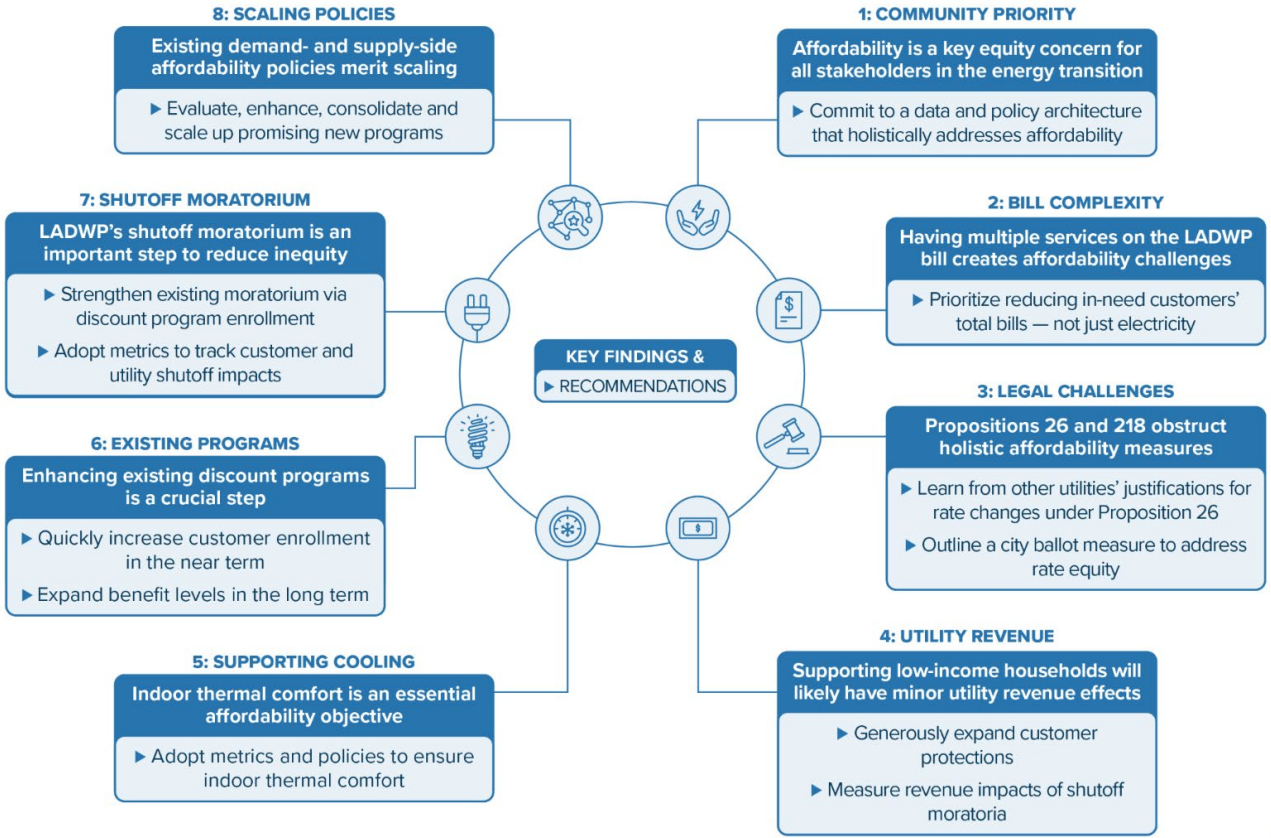
Dr. Raul Hinojosa
Professor, Chicana/o Studies;
Director, North America Integration and Development Center

Dr. Abel Valenzuela
Professor, Urban Planning; Institute for Research on Labor and Employment

Dr. Cassie Rauser
Executive Director, UCLA Sustainable LA Grand Challenge

Affordability



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Ethnic-Owned Small Business

Of small, ethnic-owned businesses…

- **Almost 1 in 3** are energy burdened
- **>50%** have been hurt by climate change
- **<25%** have a sustainability plan
- **Only 1 in 10** in LA understand DWP's energy transition

To transition to 100% renewable electricity, small EOBs need…

- new energy efficiency equipment
- payment programs to fund equipment upgrades
- multi-language educational materials on how their business can transition
- to partner with business-serving CBOs and other trusted agencies which can provide technical assistance

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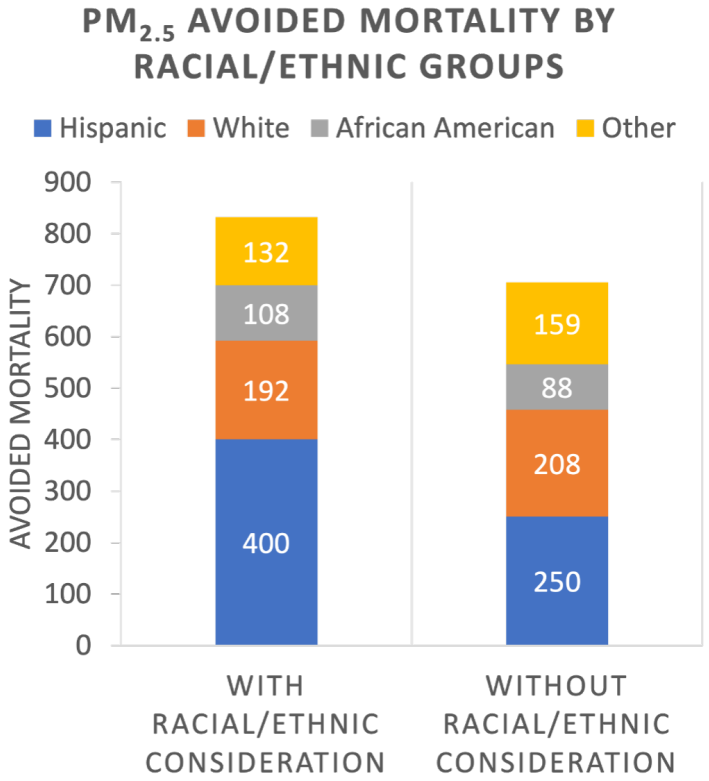
Air Quality and Public Health



Recommendations

- Prioritize electrifying medium- and heavy-duty trucks to bring the most health benefits
- To reduce ozone, further reduce NOx and volatile organic compounds in parallel with PM2.5

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Residential Panel Upgrades for Electrification

Recommendations:

- Leverage IRA funding for panel upgrades
- Pilot electrical load center retrofits at older, multi-family properties in under-resourced communities.
- Develop/adapt programs to
  - **incentivize adoption** of efficient, easily installed appliances for multi-family rentals
  - **implement "smart panel" hardware** for demand response

Electric Panel Status for Multi-Family Properties

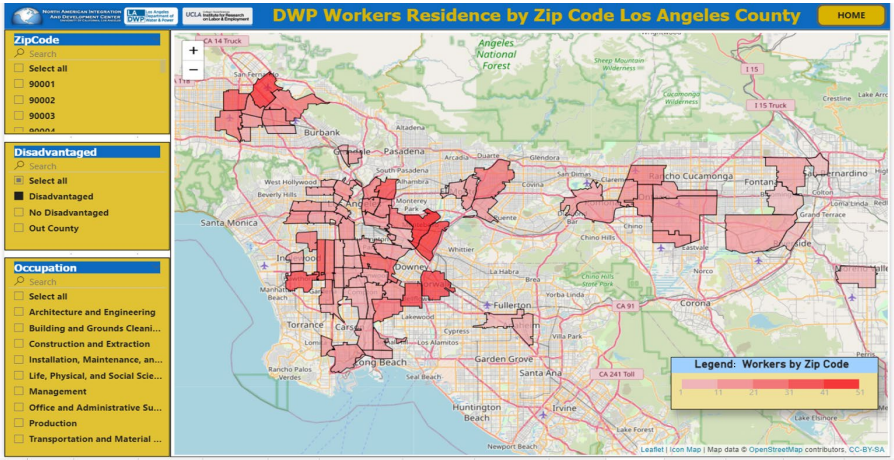
Panel Rating Classification	Upgrade Needed for Full Electrification?	DAC Properties [%]	Non-DAC Properties [%]
<90 Amps	**Likely**	**66.85%**	**56.30%**
>= 90 Amps & <150 Amps	Potentially	19.21%	30.04%
>= 150 Amps	Unlikely	13.94%	13.66%

Green Jobs and Workforce Development

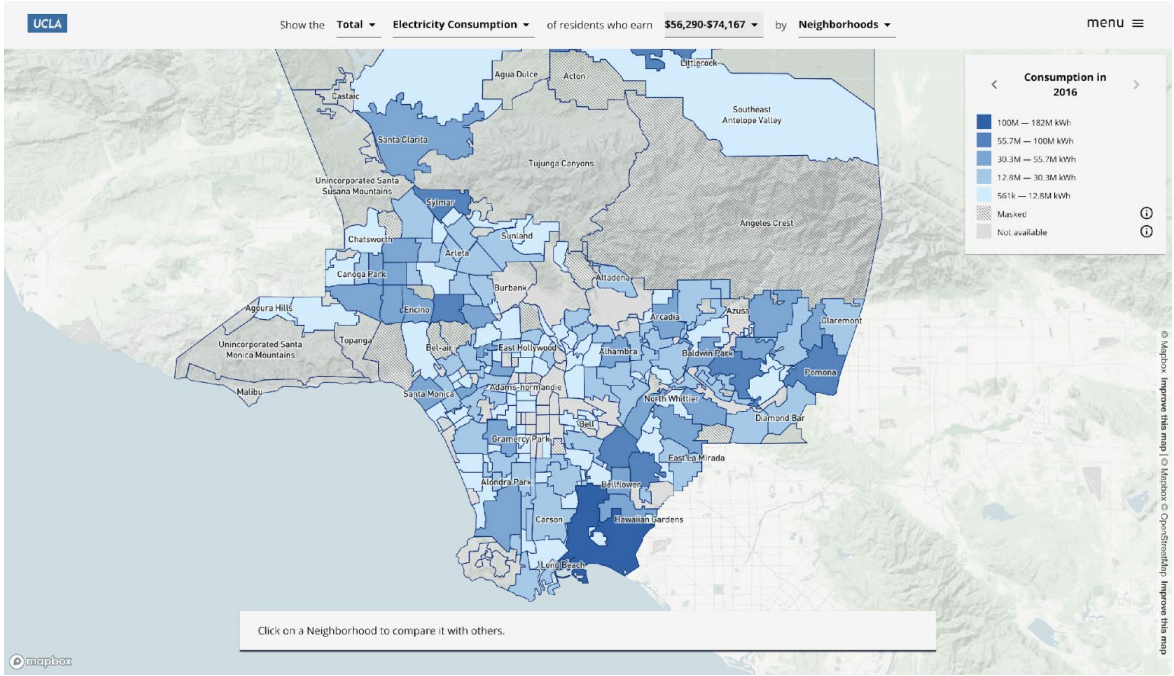
Findings and recommendations

- Continued growth in green jobs in LA City and County to 2035
- LADWP workforce training needed to close race, gender DAC gaps
- LADWP occupational training needed for in-basin construction, installation and maintenance
- Wilmington case study shows community interest in helping develop green job workforce programs

Green Jobs Data Calculator

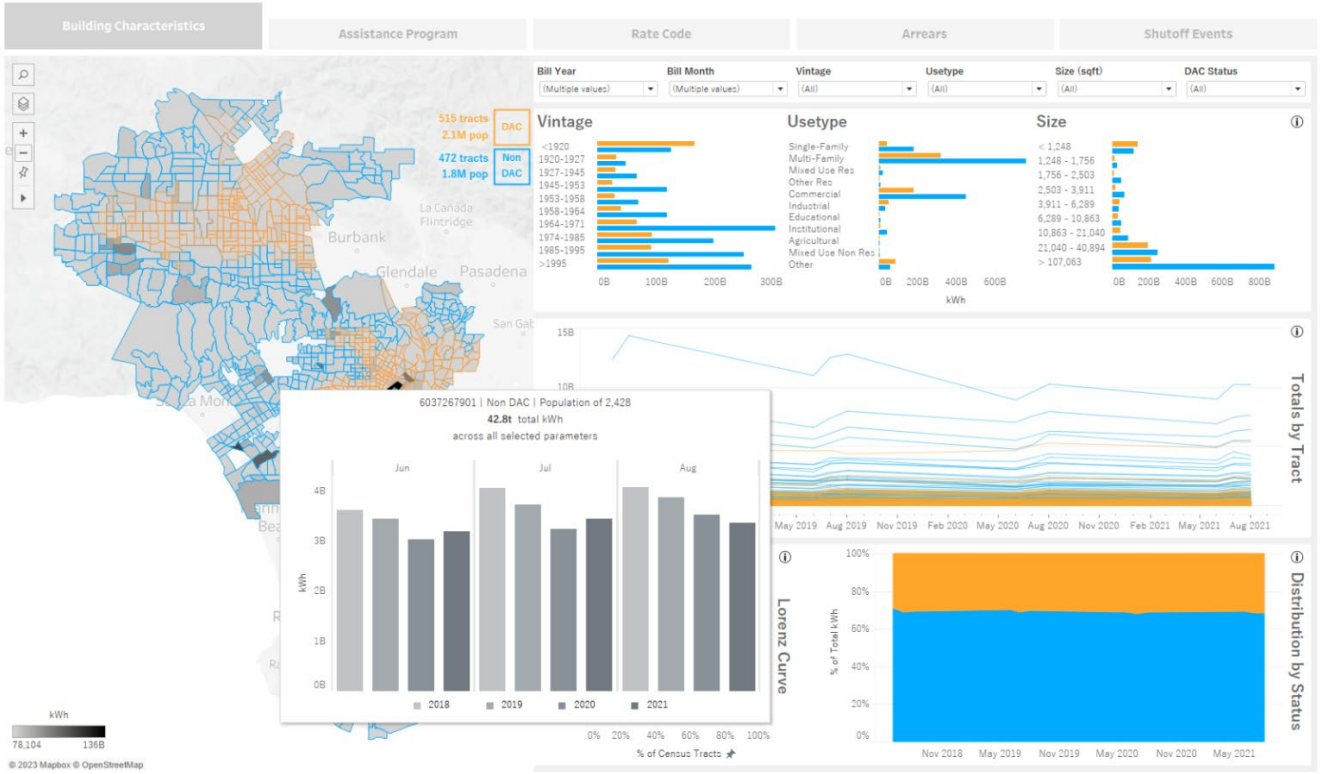


Energy Atlas: Historical Development



- **Public data platform built by California Center for Sustainable Communities**
- **10+ year** partnership with LADWP.
- Data goes back to 2005.
- Users: local governments, CBOs, public
- Functions: explore patterns of energy use normalized by building attributes, demographic variables, etc.

Energy Atlas: LA100-ES Updates



New interactive data visualization tool in beta.

- currently envisioned as an internal data reporting/metrics platform
- oriented towards LA100ES implementation.
- modular platform so it can be easily repackaged / reconfigured for public accessibility

Path forward

- Broadened two-way community engagement and advisory process
- Comprehensive metrics and monitoring platform
- Specific near-term, “obvious” policy commitments
- Further and adaptive study and implementation

Report Release
late October 2023

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Steering Committee & Advisory Committee Feedback

Partnerships for LA100 Equity Strategies Implementation

- Begin with strong commitments
- Partnership ideas:
  - Labor Unions
  - Community-based organizations
  - Public health
  - Business and commerce organizations
- Partnerships with City and County Departments and Agencies
  - Dept of Building & Safety
  - Housing
  - Consumer & Business Affairs
  - LAUSD
  - California Energy Commission

Steering Committee & Advisory Committee Feedback

Preparing our vulnerable communities for an equitable energy transition

- LADWP working with Community-based organizations and leaders
- Meet people where they're at (Promotoras, door knocking, canvassing, LADWP offices in neighborhoods)
- Training LADWP staff on outreach (identify trusted messengers, cultural competency)
- Hear from communities directly, including establishing a community advisory board
- Engage small ethnic-owned businesses to raise awareness and provide resources

Thank You to our Steering Committee for Helping to Shape a More Equitable Energy Future

Climate Resolve

SLAANC
SOUTH LOS ANGELES ALLIANCE OF NEIGHBORHOOD COUNCILS

Climate EQUITY LA

COMMUNITY BUILD

DWP-NC MOU Committee

Esperanza
COMMUNITY HOUSING

MOVELA
A PROJECT OF COMMUNITY PARTNERS

laane30
A NEW ECONOMY FOR ALL

Pacoima Beautiful

Enterprise

pace
Pacific Asian Consortium in Employment

RePowerLA

ALLIANCE of RIVER COMMUNITIES ARC

SCOPE
STRATEGIC COMMUNITY AGENDA

SLATE
South Los Angeles Transit Empowerment Zone

Next Steps:
How do WE get there?

Interim Equity Strategies

EZ-Save & Level Pay

Low-income &
Weather-based shutoff
protections

Project Powerhouse

Interim Equity Strategies

Cool LA

Comprehensive Affordable Multifamily Retrofits Program (CAMR)

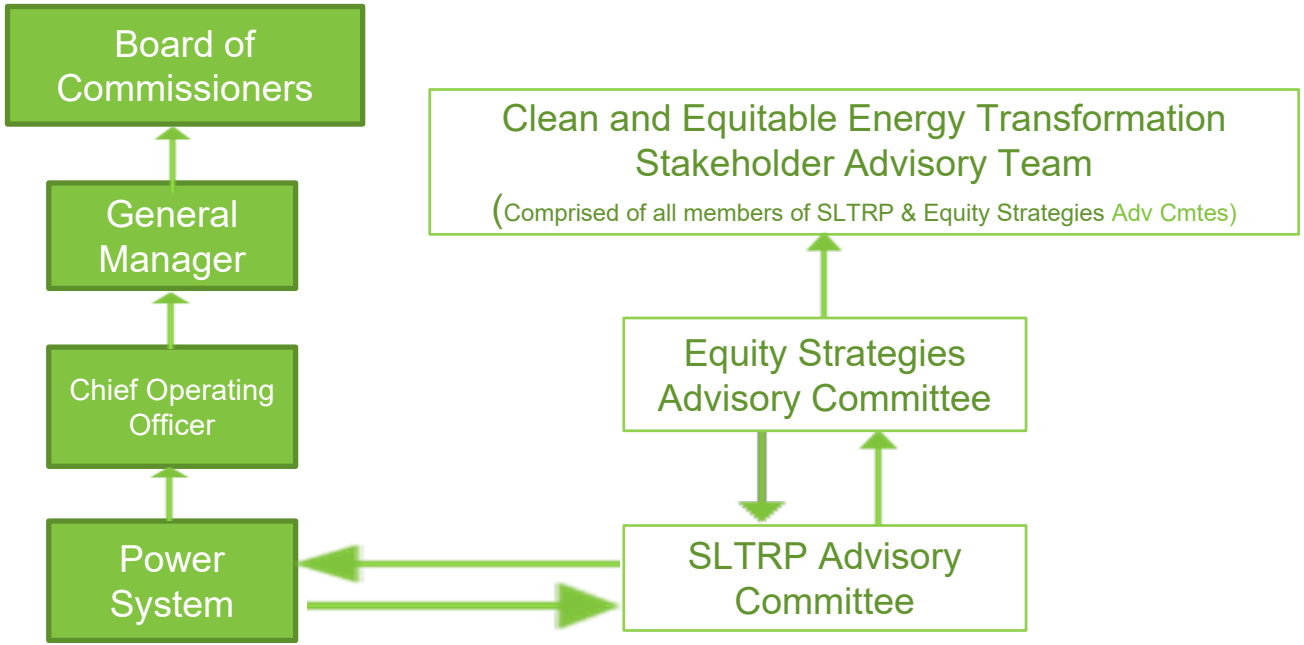
Low-income EV Rebates

Home Energy Improvement Program (HEIP)

Summary of next steps

Inform city and county leaders, departments and the public on opportunities and constraints of achieving an equitable clean energy transition.

Organizational Diagram



Conceptual Community Engagement Framework

Clean and Equitable Energy Transformation Stakeholder Advisory Team	
Combined SLTRP Advisory Committee	**Equity Strategies Advisory Committee**
Advises on SLTRP	Advises on SLTRP with Equity Lens
Local Air Quality Impacts	Climate adaptation
Rates & Affordability	Rate Design to Address Equity
Integrated Human Resource Plan	Jobs
Resources / Customer-Based	Program Design
Energy Resources	Community Grid Upgrades
	Metrics

Immediate Next Steps

- **Affordability and Burdens**
  - Enhance EE Programs, including Heat Pump Rebates
  - Expand Point of Sale Rebates
  - Power Planning to include Energy Burden
- **Access to and use of Energy Technologies, Programs and Infrastructure**
  - Enhance EV Rebates Equitably
  - Public Charging in Underserved Communities
  - Expand Community Solar

Immediate Next Steps

- **Health, Safety and Community Resilience**
  - Expand Resiliency Hubs
  - Targeted Electrification Efforts
  - Power Planning to include Air Quality Impacts
- **Strategic Long-Term Resources Plan (SLTRP)**
  - Q1 2024 SLTRP Advisory Committee & Public Outreach
  - Enhanced Criteria for Evaluation of Strategy Options

Immediate Next Steps

- **Jobs and Workforce Development**
  - Develop Pre-Apprentice Training Programs
  - Targeted Community Recruitment for Green Economy Jobs
  - Outreach and Engage Small Ethnic-Owned Businesses
- **Inclusive Community Involvement**
  - Convene Equity Strategies Advisory Committee
  - Community Involvement Grant Fund Program

Immediate Next Steps

- **Equity Strategies Advisory Committee**
  - Q1 2024 Prioritization and ES Workplan Development
    - Engagement Platforms, Enhanced Customer Programs
    - Decarbonization, Shared Solar, Equitable Infrastructure Planning
    - Metrics & Analytics, Green Jobs Workforce

Q&A

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