2025-26

LA DWP

POWER INFRASTRUCTURE PLAN

Introduction

LADWP is the nation's largest municipal electric utility. We maintain a vast Power System that includes generation, transmission, and distribution, and provide electricity to approximately 4 million people in Los Angeles and the Owens Valley via thousands of miles of overhead conductors and underground cables. The Power Infrastructure Plan outlines both recent accomplishments and future goals being implemented through the Power System Reliability Program (PSRP). The PSRP budget for fiscal year 2025-26 is $1.87 billion.

Background

The PSRP evaluates and prioritizes the maintenance and replacement of major power infrastructure. This ensures reliable electricity service for our customers now and in the future. LADWP initially launched the Power Reliability Program (PRP) in response to severe heat storms in 2006 and 2007 that caused widespread and prolonged power outages with the loss of more than 800 transformers. The program targeted replacing overloaded transformers and distribution equipment. In 2014, the program transitioned to the PSRP to encompass all Power System infrastructure, including generation, transmission, substation, and distribution. In 2021, the PSRP was updated again with expanded and accelerated goals to lay the foundation for our transformation to 100 percent clean energy.

Objectives

- Improve reliability of Power System, including generation, transmission, substation, and distribution infrastructure
- Provide proactive replacement and maintenance
- Minimize operational and repair costs
- Standardize materials and processes
- Address overloads and increase grid capacity
- Evaluate and revamp distribution system targets to achieve LADWP's goal of 100 percent clean energy

Clean Energy Future

Building on the groundbreaking findings of the Los Angeles 100% Renewable Energy Study (LA100), which explored pathways to achieving a carbon-free power grid, the City of Los Angeles and LADWP have remained steadfast in achieving one of the most ambitious clean energy goals in the nation: reaching 80% renewable energy by 2030 and 100% carbon-free energy by 2035—a full decade ahead of California's statewide target.

This bold vision requires a transformational shift in how we plan, invest, and operate. To meet these ambitious targets, LADWP is investing in grid decarbonization, scaling up distribution capacity, and preparing the system to support widespread electrification across homes, businesses, and transportation. These efforts will not only reduce emissions but also create a more resilient, equitable, and sustainable energy future for all Angelenos.

Reliability

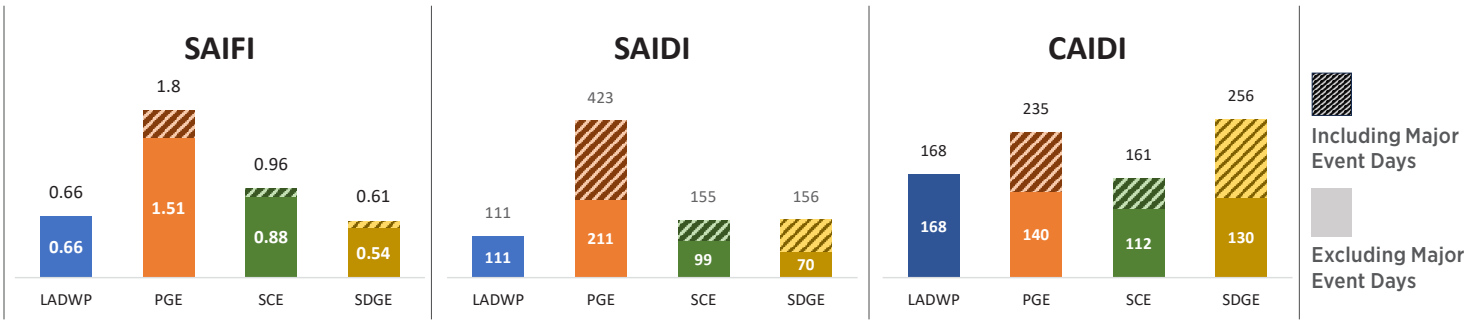
LADWP's power reliability performance metrics are on par with our peer utilities in California. The electric utility industry uses standard measures of reliability, as defined by the Institute of Electrical and Electronics Engineers (IEEE) Standard 1366:

- *System Average Interruption Frequency Index (SAIFI),* representing the number of times the average LADWP customer experienced a sustained power interruption (over five minutes) per year
- *System Average Interruption Duration Index (SAIDI),* measuring the number of sustained interruption minutes the average LADWP customer experienced per year
- *Customer Average Interruption Duration Index (CAIDI),* representing the average power interruption restoration time in minutes

LADWP uses these industry-standard reliability metrics to compare its performance to the state's investor-owned utilities (IOUs), which are closer in size to LADWP than other publicly owned utilities in California.

The charts below show the 2024 reliability performance of LADWP compared to California IOUs, both with and without the contribution from Major Event Days (MEDs). The SAIFI chart below indicates that an average LADWP customer experiences fewer than one outage longer than 5 minutes per year. Per the SAIDI chart, the average total outage duration experienced by all of our customers is slightly less than two hours. The CAIDI chart illustrates that if a customer does experience an outage, on average it takes LADWP shorter than three hours to restore power.

MEDs are rare, high-impact days when the power grid experiences an unusually large number of outages or a high total duration of outages due to extreme events. These events are analyzed separately because they can skew the normal reliability performance data. Notably, LADWP did not experience any MEDs in 2024.



2024 Reliability Performance of LADWP vs. California IOUs

Distribution

- 7,262 miles of overhead distribution lines
- 3,885 miles of underground distribution cables
- 296,796 poles
- 130,372 transformers
- 809,307 crossarms

LADWP's distribution infrastructure is the backbone of the City's power grid and crucial for maintaining neighborhood power reliability. When determining replacement, distribution facilities are prioritized based on inspections, performance record, age, location, engineering assessments of overloads, and other factors. Geographic location also impacts distribution facilities, with transformers located in higher temperature areas, such as the San Fernando Valley, exhibiting different performance characteristics as they age when compared to equipment in other areas. Regular inspections, including the use of infrared imaging, assess the condition of overhead and underground distribution systems to identify potential failure points.

Infrastructure Replacement	2024-25 Achievements	2025-26 Goals
Poles	2,743	4,000
Crossarms	10,642	13,900
Transformers	1,611	1,407
Underground Cable (Miles)	59.9	60
Substructures	18	31

Long-Term Goals

- Minimize "fix-it" ticket backlog
- Significantly expand distribution system capacity to mitigate overloading, enable widespread electrification, and meet the broader objectives of the LA100 initiative

Substations

- 3 converter stations (CS)
- 17 switching stations (SS)
- 8 switchyards (SY)
- 23 receiving stations (RS)
- 128 distributing stations (DS)
- 50 pole-top distributing stations (PTDS)

LADWP's substations play a key role in its Power System. These facilities are composed of electrical equipment required for the safe, reliable, flexible, and efficient operation and maintenance of the generation, transmission, and distribution of electricity for customers. Key substation components include:

- 68 RS, CS, and SS high-voltage banks >230 kV (line bank, bus bank, and converter banks)
- 92 high-voltage banks between 100 kV and 230 kV station banks (load bank, line bank, bus bank)
- 814 distribution load bank transformers
- 553 transmission level substation circuit breakers
- 2,044 sub-transmission level circuit breakers at distributing stations and receiving stations
- 2,883 4.8 kV distributing station circuit breakers

Transformers and circuit breakers are the most critical assets within LADWP's substations, and keeping thousands of them functioning at their best is at the heart of substation reliability. LADWP prioritizes replacement of substation transformers based on specialized tests, critical location, and age. Priorities for circuit breaker replacement are based on outage history, maintenance record, age, and location. Circuit breakers have a 36-year design life but many are older than that. Approximately 62% (3,891) of the breakers are older than 36 years and about 49% (3,061) of the breakers are older than 50 years, underscoring the need to ramp up investment in replacing critical infrastructure. In addition to replacement targets, circuit breaker life extension work is also performed. This work includes diagnostic testing, minor repairs, and the overhaul of circuit breaker parts and mechanisms.

LADWP is upgrading existing substations and constructing new distributing stations to address anticipated increases in electricity demand due to higher population density, the expansion of energy-intensive industries, and the shift towards electrifying functions currently powered by fossil fuels. Four areas in Los Angeles have been identified for potential new distributing stations. LADWP has begun the environmental study process to involve the community in the development of this infrastructure.

Plans also are underway to automate LADWP substations at a rate of 10 to 12 substations per year to improve operational capabilities and communications while reducing operations and maintenance costs. As of 2024, LADWP has automated 100 substations, including 16 receiving stations, 71 distributing stations, 8 switching stations, and 5 generating station switchyards.

Infrastructure Replacement	2024-25 Achievements	2025-26 Goals
Transformer Banks	1 (RS)	5 (2 SS and 3 RS)
Circuit Breakers	15 distribution (4.8 kV) 18 sub-transmission (34.5 kV) 2 transmission (>100kV)	75 distribution (4.8 kV) 59 sub-transmission (34.5 kV) 15 transmission (>100 kV)
Automation	1 substation	12 substations
Station Batteries	1	15
Distribution Transformers	21	26

Long-Term Goals

- Standardize major assets, such as transformers and circuit breakers, within each substation to allow for more efficient maintenance, inventory of spare parts, and training of personnel
- Upgrade or replace aging substations by 2045 to accommodate load growth and maintain reliability

Transmission System

- 4,081 miles of overhead circuits (115 kV to 500 kV)
- 136 miles of underground circuits (138 kV and 230 kV)
- 15,452 towers
- 514 maintenance holes (138 kV)
- 156 maintenance holes (230 kV)
- 1,215 joints (138 kV and 230 kV)

LADWP maintains 4,217 miles of overhead and underground transmission circuits that are part of a vast transmission system spanning five Western states. Priorities for replacements are based on inspections and outage history, with regular inspections performed on transmission towers and circuits. Existing 230 kV underground circuits have a high degree of reliability, and a new program and goals are being developed to identify and replace underground circuits for continued reliability. Additionally, all 230kV underground low-pressure oil filled (LPOF) cables have been replaced with cross-linked polyethylene (XLPE) insulated cable, mitigating the risk of complex issues and improving reliability when repairing or replacing a failed cable.

2024-25 Achievements

- Upgraded Rinaldi-Tarzana 230 kV Line 1 & 2
- Upgraded Barren Ridge-Haskell 230 kV Line 1
- Completed underground transmission lines Scattergood-Pershing Cables A & B, and Olympic-Pershing Cables A & B

2025-26 Goals

- Lugo-Victorville 500kV upgrades
- New Rosamond Switching Station cut-in (Barren Ridge Haskell L1/L2/L3)
- RS-B 138kV underground cable repair for shunt capacitor

Long-Term Goals

- Convert Tarzana-Olympic Line 1 to double circuit Tarzana-Olympic 230 kV Line 1 & 2
- Upgrade Toluca-Hollywood 230 kV Line 1
- Make upgrades to Valley transmission infrastructure, including Valley-Toluca 230 kV Line 1 & 2, Valley-Rinaldi 230 kV Line 1 & 2, and Rinaldi-Airway 230 kV Line 1 & 2 transmission line projects
- Make upgrades to Los Angeles Metro and Out-of-Basin transmission infrastructure, including Victorville-Rinaldi 500 kV Line 1, Adelanto-Rinaldi 500 kV Line 1, and Adelanto-Toluca 500 kV Line 1 transmission line projects

Generation

- 29 thermal generating units
- 7 large hydroelectric generating units
- 22 small hydroelectric generating units
- 171 generation transformers

LADWP's generation system assets are either wholly or jointly owned and provide a diverse portfolio of power that is supplemented by long-term power purchase agreements and spot market purchases. LADWP owns 29 in-basin thermal electric generating units, located at Harbor, Haynes, Scattergood, and Valley Generating Stations. Its large hydroelectric units are located at Castaic Power Plant, and the small hydroelectric units are located at 14 individual plants.

Inspections determine the need for overhauls or replacements of generating units, with replacements typically being multi-year projects. Within LADWP's portfolio, 22 small hydroelectric units are performing beyond their design life of 50 years, which is a testament to the hard work of LADWP maintenance personnel.

2024-25 Achievements

- Completed 2 comprehensive inspections (Haynes Generating Station Unit 9, Valley Generating Station Unit 7)
- Completed Castaic Power Plant Unit 3 deep cleaning

2025-26 Goals

- Replace 1 generator step up transformer
- Return Sawtelle Power Plant to service
- Perform 3 comprehensive inspections (Haynes Generating Station Units 6 & 7)

Long-Term Goals

- Replace 2 generator transformers (step up and auxiliary) per year
- Complete 6 comprehensive inspections of generating units per year

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