



JULY 2023



WATER & POWER ASSOCIATES, INC.

# NEWSLETTER

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For a Sustainable Los Angeles



## IPP Renewed Project, Part 1

By Saif Mogri

The following is Part 1 of a two-part update on the IPP Renewed Project. It has been a year since our last update and a lot has happened.

For more than three decades, the Intermountain Power Project (IPP) has served as a model of regional energy cooperation, generating and transmitting coal-fueled electricity to a diverse group of municipal utilities and rural electric cooperatives with operations across six U.S. states. As these entities' current power purchase agreements near expiration, IPP is expanding its role as a regional energy hub, including utilizing renewable energy resources to produce and store hydrogen that can be drawn upon to generate carbon-free electricity.

Currently, renewable energy, such as wind and solar power, is not dispatchable. The transition to a 100% clean energy grid will require generating resources that are dispatchable and energy storage resources with long-term, even seasonal, capabilities, such as hydrogen. IPP's proximity to the only major geologic salt dome formation in the west makes it the ideal location for siting and scaling up these emerging clean energy technologies.



IPP Site Pre-IPP Renewed

Dubbed "IPP Renewed," this transformational project includes the retirement of the existing coal-fueled units at the IPP site; installation of new natural gas-fueled electricity generating units capable of utilizing hydrogen for 840 megawatts net generation output; modernization of IPP's Southern Transmission System linking IPP to Southern California; and the development of hydrogen production and long-term storage capabilities. Upon buildout of these facilities, IPP will use renewable energy-powered electrolysis to split water into oxygen and hydrogen, storing the latter in underground salt caverns for use as fuel to drive electricity-generating turbines. The new natural gas generating units will be designed to utilize 30 percent hydrogen fuel at start-up, transitioning to 100 percent hydrogen fuel by 2045 as technology improves.

(Continued on page 3)

## Editor's Column

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Once again, I believe that we have a very interesting and informative issue of the Water & Power Associates Newsletter for you.

Our feature story is an update on the IPP Renewed Project. When the retrofit to use Green Hydrogen is completed, this project will provide the backbone for clean and reliable energy for Los Angeles. When combined with the repowering of LADWP's local natural gas fired power plants to use Green Hydrogen, LADWP will be able to continue to provide Angelinos with the high reliability they have come to depend upon and expect. At the same time, LADWP will provide a clean and reliable energy source for Los Angeles, one that the State of California has depended upon to supplement shortages within other service areas, while helping offset costs to Angelinos.

We also feature an article updating the situation on the Colorado River, where intense negotiations have taken place over the last several years. The drought has reduced storage in the reservoirs such that there was concern over losing the power generation from the Hoover Dam's power plant due to the water levels dropping below the level of the intake to the power generating units, leading to both energy and water shortages. An interim agreement seems to be in place for the next few years, although long term issues still remain to be negotiated as the demand upon the river over the long term exceeds the expected supplies.

There is also an update on the efforts in the Owens Valley to minimize the impact of this year's record-breaking snowpack on the dust control facilities that have been installed in the Owens Lake with an investment of hundreds of millions of dollars in rate payer funds.

In addition to these articles about Los Angeles' water and energy issues there are updates on energy initiatives throughout the United States that will spill over into Southern California.

Of interest are the summaries of presentations made to the monthly meetings of the Board of the W&PA by leaders in the water and energy fields.

If you are not already members, I would urge you to join the Associates in supporting sound water and energy policies, as well as safeguarding the history of the role that the development of water and electricity supplies have played in the creation of Los Angeles.

Enjoy!

*Jerry Gewe, Editor*



# IPP Renewed Project, continued from page 1

Plans for IPP Renewed have been in development for over a decade by IPP participants. Going forward, these entities will continue to play key roles in the implementation of the project:

- Intermountain Power Agency—a political subdivision of the State of Utah with municipalities as members—is the project owner.
- Intermountain Power Service Corporation employs the people who work at IPP.
- Los Angeles Department of Water and Power—the largest purchaser of electricity from IPP—also serves as the Operating Agent and Project Manager.

The Intermountain Power Project’s 4,614-acre site near Delta, Utah, is home to substantial existing infrastructure as well as an abundance of space in which to build the additional facilities that will be required going forward. In addition to land and skilled people, existing infrastructure and resources include ample water, two major electricity transmission systems, a microwave communications system, access to railroad and highway transportation, close proximity to existing interstate pipelines, and a site located directly over the only high-quality geologic salt dome in the Western United States.

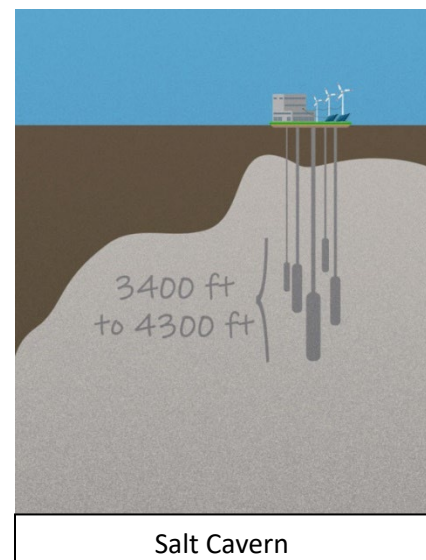
The geologic salt dome (owned and operated by Magnum Development), which is already being used for storage of liquid fuels in solution-mined caverns deep underground, provides opportunities for grid-scale real-time and seasonal energy storage.

A key element of the renewal project is the modernization of the 2,400-megawatt-capacity Southern Transmission System. That high-voltage transmission system provides a direct-current link from the IPP site to Southern California and represents a critical element in the delivery of renewable electricity to the Western U.S. power grid.

A key feature of the IPP Renewed project is the plan to utilize “green” hydrogen. Unlike hydrogen produced from fossil fuels, green hydrogen is produced by electrolysis—extracting hydrogen from water—using renewable energy sources (such as wind, solar, and geothermal) to power the process.

Hydrogen can be used to fuel electricity generation and produces none of the greenhouse gas emissions associated with climate change. Hydrogen can also be stored for later use. And unlike batteries, which can store electricity for hours, hydrogen can be stored for many months. This can facilitate seasonal energy storage, saving up energy produced from renewable resources whenever they are abundant for use in summer or winter months when renewable energy supplies may run short.

Green hydrogen production costs are expected to plummet over the next several years as projects like IPP Renewed advance in numerous locations around the world. Energy and environmental publications and policymakers around the globe are taking special notice of the IPP Renewed project for its unique advantages in being able to use both existing infrastructure and salt cavern storage potential.





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## Energy Workforce Grew 3.8% Last Year; Clean Energy Jobs Increased in Every State

Excerpted from Utility Dive, June 29, 2023 by Jack Feldman

[https://www.utilitydive.com/news/DOE-energy-jobs-report-clean-energy-employment-grew-every-state/654252/?fbclid=IwAR2Vs\\_04jTW-QUqLvvcvL04OO-IUINC-8AceRqPAOqEtk1C4i46Jcqv3eTs](https://www.utilitydive.com/news/DOE-energy-jobs-report-clean-energy-employment-grew-every-state/654252/?fbclid=IwAR2Vs_04jTW-QUqLvvcvL04OO-IUINC-8AceRqPAOqEtk1C4i46Jcqv3eTs)

The energy sector experienced substantial job growth in 2022, adding nearly 300,000 jobs at a rate of 3.8%, according to the U.S. Department of Energy's annual study. Clean energy jobs saw a national growth rate of 3.9%, with every state witnessing an increase in these employment opportunities. Solar and wind emerged as the largest employment sectors in power generation technologies, with solar growing by 3.7% and onshore wind by 4.4%. Despite its small job count, offshore wind exhibited the fastest growth rate at 20.3%. Clean energy electricity technologies accounted for nearly 87% of net new jobs in the power generation sector. Energy efficiency jobs also saw growth, adding about 50,000 jobs, and employers anticipate further growth of 6.4% in this sector.

The report highlights the challenges faced by employers in finding qualified workers, with over four out of five employers across various energy technologies reporting some difficulty in recruitment. Motor vehicles and energy efficiency sectors faced the highest hurdles in finding skilled personnel. However, despite these obstacles, the clean energy sector is expected to continue its upward trajectory. The Biden administration's investments through the Bipartisan Infrastructure Law and Inflation Reduction Act are anticipated to fuel further growth in the clean energy industry, setting the stage for a significant economic transition and job creation in the years ahead.



Photo Courtesy Southern California Edison

# Jeff Kightlinger Receives William Mulholland Public Service Award

By Jerry Gewe



**Jeff Kightlinger - 2023 Recipient**

At the May 10, 2023 meeting of the Water and Power Associates, Jeff Kightlinger was presented the William Mulholland Public Service Award, an award that is given to persons who have provided significant impact on the water or energy policies of Los Angeles, Southern California or the State of California.

Jeff Kightlinger was the Chief Executive Officer for The Metropolitan Water District of Southern California from 2006 to 2021. He was the longest serving CEO in the history of Metropolitan. As CEO, he oversaw Metropolitan's \$1.8 billion annual budget and 1,800 employees. He was also responsible for Metropolitan's daily water and power operations and negotiated strategic agreements on the Colorado River, the 50-year renewal of Hoover Dam hydroelectric power, and on the operations of the State Water Project.

As CEO of MWD, he led the urban water agencies of California in pursuing the Delta fix which has been under consideration for decades since the original Peripheral Canal Project. When California's Agricultural Agencies declined to provide funding for their share of the current proposal, he persuaded MWD to assure the necessary funding. The project is still undergoing environmental review.

Prior to becoming CEO, Kightlinger was Metropolitan's Chief Legal Officer, and a known expert on water law and the law of the Colorado River.

The Metropolitan Water District is the largest municipal water provider in the nation delivering an average of over 2 billion gallons of water a day to 19 million residents in Southern California. Metropolitan also funds local conservation and recycled water projects to ensure the region's water reliability.

Kightlinger has an undergraduate degree from the University of California at Berkeley and a law degree from Santa Clara University. He has served on a number of public service boards including the Coro Foundation, the USC Price School of Public Policy, the UCLA Sustainability Advisory Board, the Climate Action Reserve, the California Foundation on the Environment and the Economy, the Los Angeles Economic Development Council and the Los Angeles Chamber of Commerce.

<b><u>Mulholland Public Service Award Recipients</u></b>
Jeff Kightlinger (2023)
Dorothy Fuller (2021)
Phyllis E. Currie (2012)
Rick J. Caruso (2001)

# Colorado River Update

By Robert Yoshimura

The Colorado River has been a topic of great interest to the water users of the southwestern USA because of the severe, climate related 23-year drought that has threatened both the water supply and hydroelectric power generation for the region. Since 1999, the water level in Lake Mead, a major source of water supply for the Lower Basin states of Arizona, California, and Nevada, has declined by 175 feet and now holds only 28% of its capacity. At the outset of the drought, the water level stood at 1,215 feet and declined to its all-time low of 1,040 feet in July of 2022. Measures to curtail water deliveries such as the 2007 Interim Shortage Guidelines, the Drought Contingency Plan, the Binational Water Scarcity Contingency Plan, and the Colorado River 500+ Plan have proven insufficient to sustain the water levels in Lake Mead.



Recognizing the dire circumstances, in June 2022, the US Bureau of Reclamation (USBR) called for the seven states using Colorado River water to develop a voluntary plan to conserve a combined additional 2 to 4 million acre-feet (AF) per year. The seven states failed to meet deadlines for that plan and USBR subsequently offered their own plan that would be unilaterally imposed on the three Lower Basin states. The USBR plan contained two options: one was to cut back based on historic water rights that would be favorable to those with the most senior rights; and a second was to cut back a fixed percentage across the board, which would penalize those with the most senior rights.

Because neither option was acceptable to all three Lower Basin states, they and the USBR doubled down on their efforts to develop an alternative to the USBR plan. On May 22, 2023, all seven Colorado River user states submitted the Lower Basin conservation plan to the USBR and requested its inclusion as an alternative in the Draft Supplemental Environmental Impact Statement (DSEIS) which evaluates modifications to the 2007 Interim Shortage Guidelines that govern the operation of the Colorado River's major reservoirs through 2026. The Lower Basin plan will conserve three million acre-feet of water through the end of 2026. The DSEIS will be reissued and finalized later this year.

The proposed level of conservation amounts to one million acre-feet per year, which is significantly less than the two to four million acre-feet per year originally requested by USBR (from all seven states). However, the record rainfall and snowpack of the past winter has raised river flows and reservoir levels sufficiently to provide time for the seven basin states to forge a permanent solution to the reduced flow in the Colorado River post-2026. The predicted year-end elevation of Lake Mead in 2023 is 1068 feet, 22 feet higher than last year. Thus, the current proposal, if accepted, would be a temporary solution that will provide some immediate relief for Lake Mead (and the upstream Lake Powell). All seven basin states must, however, develop a long-term agreement that will balance river flows and demand beyond 2026.

Under the terms of the agreement, the Lower Basin states will give up a total of 3 million acre-feet over the three-year period between now and the end of 2026. The federal government will compensate farmers and other water users for up to 2.3 million acre-feet of conserved water from funds available through the Inflation Reduction Act. The remaining 700,000 acre-feet of uncompensated conservation will be voluntary and, in some cases, will utilize existing programs

such as the Intentionally Created Surplus (ICS) program that allows contractors such as MWD to store water in Lake Mead for later use.

Southern California is in a good position to voluntarily conserve water because the record snowpack in the state has filled all its reservoirs and will result in the delivery of 100% of its State Water Project Allocation this year, compared to only 5% in the previous two years. MWD thus plans to leave 130,000 acre-feet of water it normally receives from the Palo Verde Irrigation District in Lake Mead and voluntarily store 250,000 acre-feet of ICS water as well.

The Upper Basin States (Colorado, Utah, Wyoming, and New Mexico) support the Lower Basin conservation plan and through the Upper Colorado River Commission, have reauthorized their System Conservation Pilot Program (SCPP). The SCPP will conserve additional Colorado River water using voluntary compensated measures funded by the federal government to mitigate depleted storage in the Upper Basin.

## Record Eastern Sierra Snowpack

*By Jerry Gewe*

The 2022-23 Snowpack in the eastern Sierra was the highest in the almost 100 years that LADWP has been keeping records of the water content in the snowpack. This year the weighted maximum average water content of the Department's snow pillows was on April 4. The reading was 68.1 inches of water. This is 301% of the normal water content of 20.5 inches.



Historically hydrographers would take snow course readings of the water content in the snow at the beginning of each month along 6-10 points, approximately 100' feet apart. The same locations would be used each year to allow for accurate comparisons. While the snow surveys are conducted in the same manner today, continuous readings are taken electronically at representative locations to allow constant comparisons.

Refer to the chart below to see the comparison of this year's snowpack as compared with other years. The lowest content was during the drought of 2014-15. The prior wettest year was in 2016-17. You can see the progression of the snowpack in different years. Some years like 2021-22 start off wet and fizzle out. Other years like this year and 2016-17 start off strong and remain strong. Average buildup through the season almost never happens.

Notice the melt off the snow pack which started this year in early April. The cool spring, this year, delayed runoff which was beneficial to the department in that they had time to better prepare to handle the runoff to avoid damage to facilities. These include the department facilities, facilities of other government agencies such as Cal Trans, and private property owners.

This year, there was concern that the runoff from this record snowpack would cause damage to facilities in the Owens Gorge. However, the cool spring delayed the runoff allowing the department to lower the water level in Long Valley reservoir to reduce the peak flows. Flows exceeding the capacity of the Gorge Power Plants could have



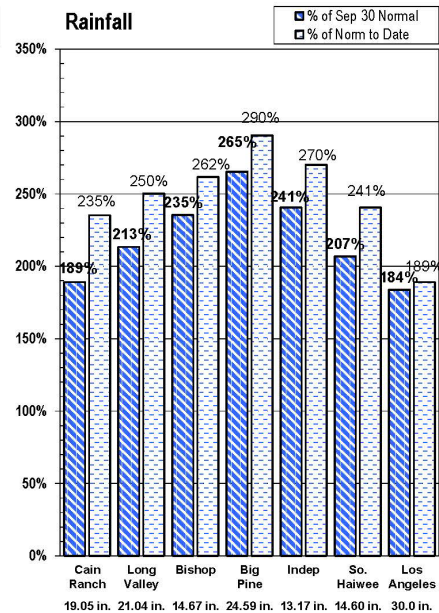
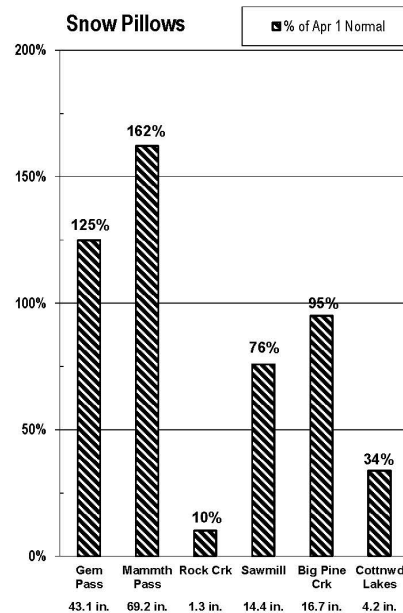
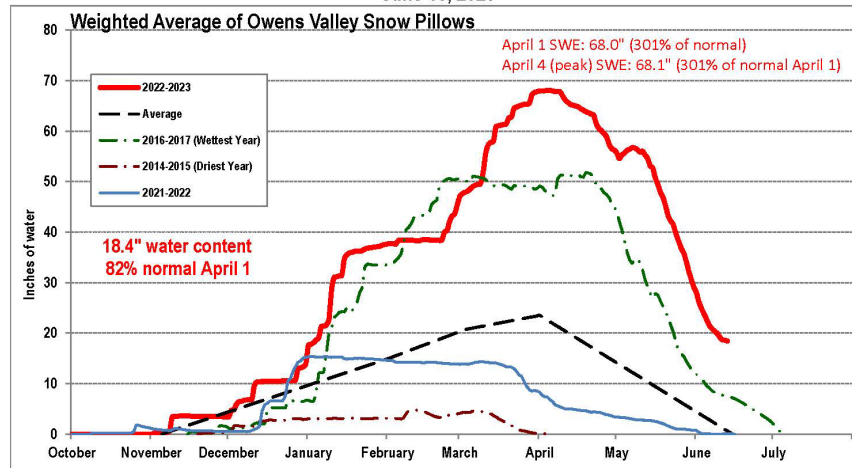
been damaging to the generating facilities as well as washing out the Tui Chub which is an endangered species that only lives in the Owens River Gorge and would have resulted in massive fines to the Department.

The other major area with a high value negative impact from the high runoff lies at Owens Lake, where the Department has invested hundreds of millions of dollars for dust control facilities to meet air quality standards. Substantial portions of facilities were in danger, which required the Department to make major improvements and adjustments to protect our customer's investments.

See the article on measures for handling the runoff projected for the Owens Lake on page 14.



**EASTERN SIERRA  
CURRENT PRECIPITATION CONDITIONS  
June 13, 2023**



Measurement as Inches Water Content; Precipitation totals are cumulative for water year beginning Oct 1



# More Renewables, Gas Generation Likely to Reduce U.S. Summer Coal Demand

Excerpted from Power Engineering Magazine, June 9, 2023 by William Glauz

<https://www.power-eng.com/news/more-renewables-gas-generation-likely-to-reduce-u-s-summer-coal-demand-eia-says/#gref>

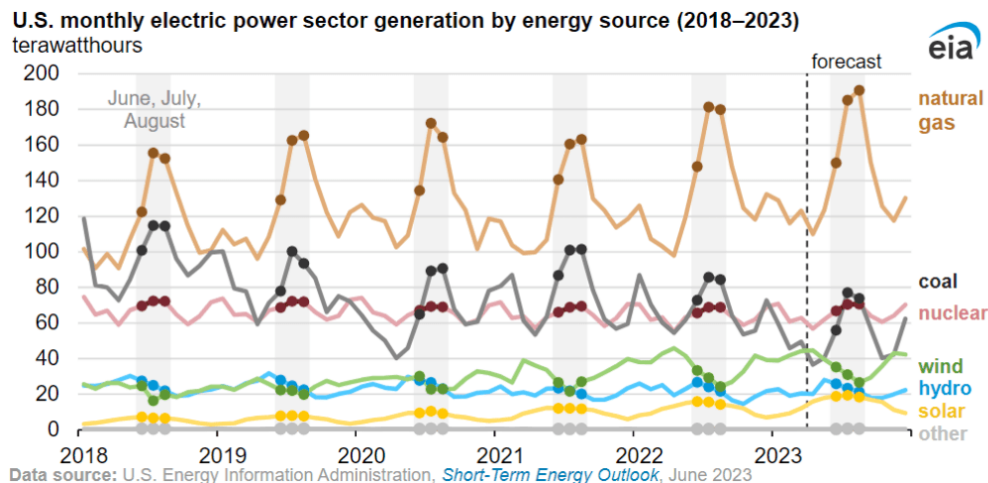


The U.S. Energy Information Administration (EIA) forecasts that the largest increases in U.S. electricity generation this summer (includes June, July, and August) will come from solar, wind and natural gas-fired power plants.

According to EIA's June Short-Term Energy Outlook, the increase from these sources will likely be offset by reduced generation from coal-fired power plants. Between June 2022 and May 2023, about 11 GW of U.S. coal capacity retired, and EIA

expects 15% (36 TWh) less U.S. coal-fired generation this summer compared with Summer 2022.

Because of additional natural gas-fired generating capacity and favorable fuel costs, EIA expects U.S. gas-fired generation to grow by 3% (or 16.7 TWh) this summer compared with last year. But, a large share of America's new generating capacity built in over the past few years is powered by solar or wind. The U.S. electric power sector added an estimated 14.5 gigawatts (GW) of solar and about 8 GW of wind during the 12 months ending May 31, 2023.



Wind power has been the leading source of new renewable electricity generation in recent years and is an especially important component of the generation mix for some regions during the spring months.

U.S. wind-powered generation this summer could be 7% (5.8 TWh) higher than last summer, according to EIA.

# Judge Rules Montana Gas-Fired Plant Can Move Forward, While Landmark Climate Case Begins

Excerpted from Power Magazine, June 12, 2023 by William Glauz

<https://www.powermag.com/judge-rules-montana-gas-fired-plant-can-move-forward-while-landmark-climate-case-begins/>

A judge has ruled that construction of natural gas-fired power plant in Montana can resume, two months after the same judge ordered the project halted due to environmental concerns.

The 175-MW Yellowstone County Generating Station, a \$283 million facility sited near Laurel, has been dogged by legal actions after its air permit was challenged in a 2021 lawsuit from the Montana Environmental Information Center and the Sierra Club. The plant, located along the Yellowstone River, would serve customers of South Dakota-based NorthWestern Energy, which operates in South Dakota, Montana, and Nebraska, and also provides power for Yellowstone National Park.



*Rendering of the Yellowstone County Generating Station Source: NorthWestern Energy / YouTube*

Judge Michael Moses on June 8 cited a “changing legal landscape” in reversing his earlier order, which NorthWestern appealed to the Montana Supreme Court. Moses’ latest ruling comes after state lawmakers enacted legislation eliminating a requirement for officials to look at the climate impacts of such projects during the permitting process.

Montana officials’ support for the fossil fuel industry is being challenged in a landmark climate case that began June 12 in a courthouse in Helena, the state capitol. A group of 16 young plaintiffs is suing state government, charging that continued use of fossil fuels is in violation of a state constitutional mandate to “maintain and improve a clean and healthful environment in Montana for present and future generations.”

The plaintiffs, ranging in age from 5 years to 22 years, say their future is threatened by climate change. The trial, expected to last two weeks, began with opening statements June 12. Should a judge determine that state support for the fossil fuel industry is unconstitutional, it could provide a precedent for similar actions in other states, according to legal experts.

Lawyers representing Montana have tried to block the case from proceeding to trial. The lawyers in a recent motion said a court proceeding would be a “show” trial that is a “gross injustice.”

Our Children’s Trust, an environmental group that helped bring the Montana lawsuit, said many of the plaintiffs plan to testify during the trial. The group has taken legal action in every state on climate issues, with several of its lawsuits pending. The group recently won a preliminary victory in a case in Oregon, when a judge on June 1 ruled that an action taken there and aimed at the federal government could proceed to trial.

Moses in his June 8 ruling said restoring the air permit for the Yellowstone plant could help NorthWestern customers avoid higher energy bills, since delaying construction likely would increase the cost of the project. There are still legal challenges to the plant's construction, including one by people opposed to building the plant near Laurel. Opponents of the plant have cited pollution and other concerns, such as the impact of the plant's lights on nearby residents.

NorthWestern has said it expects to bring the facility online at some point in 2024. Construction began after the initial issuance of the air permit in September 2021.

The plant will feature 18 9.7-MW reciprocating internal combustion engines (RICE). The RICE units are Caterpillar's G20CM34 generator. Burns & McDonnell serves as the engineering, procurement, and construction lead on the project.

## AES Buys Solar + Storage Project in California

*Excerpted from Renewable Energy World, June 8, 2023, by William Glauz*

<https://www.renewableenergyworld.com/solar/aes-buys-solar-storage-project-in-california/#gref>

AES Corporation said it acquired from Avantus (formerly 8minute) the 2,000 MW Bellefield project, which is currently in late-stage development and is one of the largest permitted solar-plus-storage projects in the United States.

The project is located in Kern County, California, and includes two phases, each with 500 MW of solar and up to 500 MW of four-hour duration battery energy storage.

Phase one has a 15-year Power Purchase Agreement to deliver hourly energy to an existing AES corporate customer. AES said it expects to contract up to an additional 1 GW of solar-plus-storage in phase two of the project by the end of 2023.

The two phases were developed by the seller, Avantus, and are expected to come online in 2025 and 2026, respectively.

AES has been shifting from its portfolio of coal-fired plants to renewable energy projects. It plans to exit its coal portfolio by the end of 2025. It announced it also expects to triple its renewable energy capacity by adding 25 to 30 GW of solar, wind and energy storage.



(Credit: AES)

# LADWP Extends Power Sales Agreement for Pacific Northwest Wind Farm for Four Additional Years

Excerpted from LADWP News, June 5, 2023, by William Glauz

<https://www.ladwpnews.com/wind-power-agreement-moves-ladwp-closer-to-a-carbon-free-future-while-saving-millions-for-customers/>



Photo of Windy Point Project, courtesy of Windy Flats Partners, LLC

The Los Angeles Department of Water and Power (LADWP) has taken a significant step toward achieving 100% clean energy for Los Angeles by extending the Power Sales Agreement with the Southern California Public Power Authority (SCPPA) for approximately 262 megawatts (MW) of renewable energy from a major wind farm in the Pacific Northwest. LADWP's action will support upgrading the existing wind turbines to extend their lifespan at a reduced price that is expected to save about \$72.3 million over four years.

Since 2010, the Windy Point Project, also known as Windy Flats, located in Goldendale, Washington, has been a part of LADWP's

renewable energy portfolio, which was estimated to be more than 40% of total retail power sales in 2022. Under the amended agreement, LADWP will receive about 700,000 megawatt-hours (MWh) per year of clean, efficient wind power for four more years—from 2030 through 2034—from the wind farm. That amount of green power will serve more than 116,000 Los Angeles homes and offset nearly 230,000 metric tons of CO<sub>2</sub> emissions annually, equivalent to removing more than 52,300 gas-fueled cars from the road each year.

"This agreement is an important part of achieving our accelerated goal of 80% renewable energy by 2030 and to ultimately become 100% carbon free," said Martin L. Adams, LADWP General Manager and Chief Engineer. "LA will continue receiving high-quality wind power at a significantly reduced price while optimizing a key transmission line connecting the Pacific Northwest to Los Angeles," Adams said.

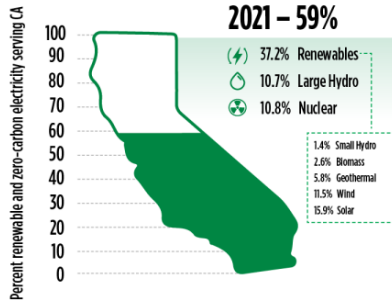
As the only recipient of energy from the Windy Point Project, LADWP will continue to administer and oversee the amended agreement, under which the utility will receive energy from Windy Point at a new price of \$56.46 per MWh for the extended four-year term at a total cost savings estimated to at \$72,324,000. The amended agreement was approved by the LADWP Board of Water and Power Commissioners in November 2022 and the SCPPA Board of Directors in March 2023.

# New Data Shows Growth in California's Clean Electricity Portfolio and Battery Storage Capacity

Excerpted from the California Energy Commission, May 25, 2023 by William Glauz

<https://www.energy.ca.gov/news/2023-05/new-data-shows-growth-californias-clean-electricity-portfolio-and-battery>

## California Progress Toward 100% Clean Electricity by 2045



The latest data from the California Energy Commission (CEC) shows that in 2021 more than 37 percent of the state’s electricity came from Renewables Portfolio Standard (RPS)-eligible sources such as solar and wind, an increase of 2.7 percent compared to 2020.

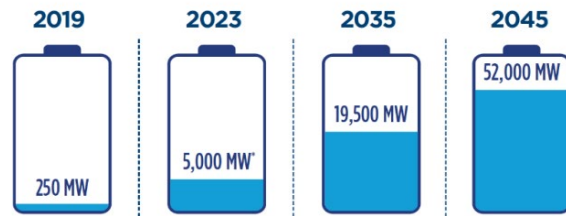
When combined with other sources of zero-carbon energy such as large hydroelectric generation and nuclear, nearly 59 percent of the state’s retail electricity sales came from non-fossil fuel sources. This amount remains unchanged from 2020 despite the jump in renewables due to drought-related declines in hydroelectric generation.

California’s RPS program requires all load-serving entities in California to procure a portion of their electricity sales from eligible renewable resources. The program was established in 2002 with an initial requirement that 20 percent of electricity retail sales be served by renewable resources by 2017. Escalating requirements saw the goal increase to 33 percent by 2020 - a target that was met two years early in 2018.

Senate Bill 100 (2018) accelerates the RPS goal to 60 percent by 2030. The landmark policy also requires RPS-eligible sources and zero-carbon resources to supply 100 percent of California’s electricity retail sales and electricity procured to serve state agencies by 2045. To keep the state on track, last year Governor Gavin Newsom signed SB 1020 (2022), establishing interim targets of 90 percent clean electricity by 2030 and 95 percent by 2040.

To complement California’s abundant renewable energy resources, the state is focused on deploying energy storage. According to the California Independent System Operator, battery storage capacity has increased by nearly 20 times since 2019 - from 250 megawatts (MW) to 5,000 MW. Today’s fleet of storage resources can capture enough electricity to power up to 5 million California homes. By midcentury, capacity is projected to increase another 10 times to 52,000 MW.

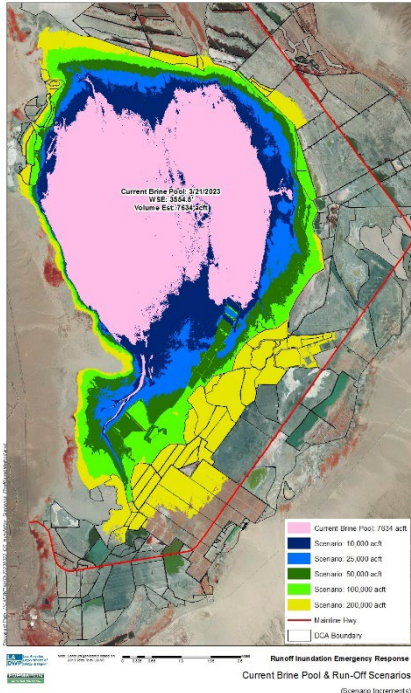
## California’s growing battery storage capacity captures the state’s abundant renewable resources



\*Projected as of June 1, 2023 based on California ISO interconnection queue.

# Impact of Runoff on Owens Lake Dust Control Facilities

By Jerry Gewe and Robert Yoshimura



The record breaking snowpack of this winter was a very beneficial for the water supply of Los Angeles. However, it also posed the possibility of a large negative financial impact upon the customers of LADWP, due to the potential for flooding the dust mitigation facilities in the Owens lakebed. As of March 21, 2023 the brine pool (the salt water within the historic lake bed) contained 7,634 acre feet of water. Analysis of possible scenarios for the runoff going into the lakebed using data from 1969 (the highest flows into the lake in recent history) projected that the pool could expand to as much as 200,000 AF of water, depending on how the runoff progressed which was dependent upon the ultimate snowpack and the rate of the runoff.

Hypothetical boundaries for runoff of 10,000 to 200,000 AF of flood waters were added to the drawings to show the impact of various degrees of flooding. Worst case scenarios predicted impacts to 10 -15 square miles of lake surface that would require \$20 million to \$30 million of capital expenditures per square mile to mitigate the impact.

During the last two decades billions of dollars of rate payer money have been spent on dust control facilities to meet the air quality regulations imposed upon the Department. The analysis showed that much of the dust control facilities that have been installed could be damaged resulting in a cost of up to \$500 million to the rate payers, not including possible fines for environmental violations. This would far exceed the savings in reduced water imports.

On March 21, 2023, The City Council enacted an emergency proclamation enabling fast-tracking of the mitigation design, bid and build process including streamlining the environmental requirements. The bidding process was reduced from a normal one and one-half years to one month. The resulting contract included everything that could possibly be required to complete the mitigations. Although competitive bidding was not required because of the emergency proclamation, bids were requested from multiple contractors. The range of proposals ranged from \$23 million to \$56 million, with the lowest proposal being an order of magnitude less than the expected cost for repairs if the facilities had been destroyed.

The rapid progress in obtaining and implementing this contract, coupled with a cool spring and a slower than anticipated runoff has minimized the damages to facilities. The attached photos show the type of activities that have been implemented to protect the dust control facilities.



# California Can't Kick Its Coastal Gas Plant Addiction

Excerpted from the Los Angeles Times, June 22, 2023, by Saif Mogri

<https://www.latimes.com/environment/newsletter/2023-06-22/california-just-cant-kick-its-coastal-gas-plant-addiction-boiling-point>

California probably won't have too much trouble keeping the lights on this summer, unlike the last few years unless extreme heat blankets the American West for days on end, or wildfires knock out key electric lines. State officials say the abundant snowpack in our mountains and water in our reservoirs should give us plenty of hydropower, helping avert blackouts even on hot evenings after the sun goes down and solar panels stop generating, but along with solar panels thousands of megawatts of battery storage have been added to the grid.



The recent heat waves have driven up demand for air conditioning and fires continue to get bigger and hotter, threatening the electric grid. The Western US has been dry for several years and most probably California will not have so much hydropower in future years.

To avoid blackouts or even rolling blackouts, State officials are once again considering extending the life of three gas plants along the Southern California coast. The natural gas-fired power plants in Huntington Beach, Long Beach and Oxnard were supposed to shut down in 2020, under a regulation designed to protect marine life, but officials allowed the gas generators to keep generating power for another three years, just a few weeks after California experienced rolling blackouts in 2020.

For now, Gov. Gavin Newsom and his appointees say the best answer is to keep burning gas at the coastal plants. There is also general opposition to the extension of operation of these units. A report released by the California Environmental Justice Alliance and the Sierra Club explains how California's dozens of gas plants performed poorly during last summer's devastating 10-day heat wave, when the Golden State avoided rolling blackouts only after Newsom sent an emergency alert requesting people to use less electricity.

They found that between 10% and 15% of the state's 40 gigawatts of gas power was typically unavailable during the high-demand evening hours. High temperatures contributed to some gas plants generating less than expected and others going offline entirely. The North American Electric Reliability Corporation (NERC) has found that generator outages during extreme weather conditions are the biggest risk to the electric grid.

It's not just California struggling to keep the lights on in an era of climate crisis. Texas officials asked residents to use less electricity during a heat wave, two years after a winter storm resulted in loss of power to millions of Texans. NERC has warned that extreme heat could lead to energy shortages in other regions this summer.

Environmental justice groups want Newsom's appointees to focus on other strategies for keeping the power on, such as local solar and battery installations, energy-efficiency upgrades and "demand response" programs that pay people to use less energy when there's not enough to go around. The state has invested in all those areas, but critics say it could invest a lot more.

California is still dependent on gas and will be for years for the reliable operation of the electric grid, even in a best-case scenario for climate action. Gas plants supplied 42% of the state's power in 2022, according to the U.S. Energy Information Administration.

# Mystery History Question

Presented by Jack Feldman



This 1929 photo shows a large body of water located near the recently completed UCLA campus. View is looking southeast. The lake-like reservoir was installed by the Los Angeles Bureau of Water Works & Supply (later LADWP) in 1924.

## Question #1

This reservoir was used until at least the 1960s when it was replaced by a large underground storage tank installed nearby. What was the name of this now forgotten water reservoir?

- A) Bel Air Reservoir
- B) Sawtelle Reservoir
- C) University Reservoir
- D) West LA Reservoir
- E) Westwood Reservoir

## Question #2

What is there today where this once scenic reservoir existed?

- A) UCLA Parking Structure
- B) UCLA Intramural Fields
- C) Marymount High School
- D) Bel Air Golf Course

**Answers on page 23,** or Click [HERE](#)

[https://waterandpower.org/museum/Mystery\\_History.html](https://waterandpower.org/museum/Mystery_History.html)



# GUEST SPEAKERS

Summaries by Robert Yoshimura

GUESTS OF THE MONTH

APRIL 2023

Jason Rondou, Director of Power System Planning and Yamen Nanne, Manager of Distribution System Planning and Development

## UPDATE ON LADWP PLANS TO UPGRADE THE POWER DISTRIBUTION SYSTEM TO ACCOMMODATE THE CONVERSION TO RENEWABLE ENERGY

Jason Rondou introduced the presentation with a cautionary statement about the difficulties of achieving 100% renewable energy affordably while maintaining system reliability. The new Mayor and Council have not yet expressed their opinion or taken a position on the previous administration's goal of achieving 100% renewables by 2035 instead of 2045 as mandated by SB 100. They have expressed that reliability is of primary importance and may thus be amenable to some flexibility in the schedule.



Yamen Nanne, reported LADWP is considering three planning cases that achieve 100% renewables by 2035. The basis for those planning efforts is the energy demand forecast that begins with projected increases in base demand from the Integrated Resource Planning (IRP) process and adds projections for additional demand from the electrification of buildings and transportation. Those forecasts show that energy demand will more than double between now and 2050, while the peak load is forecast to increase from 6,500 MW to 8,000 MW. Forecasts of electric vehicle growth are fraught with uncertainties. The challenge for LADWP will be to build distribution facilities to accommodate demand growth without overbuilding, if growth from electric vehicles doesn't keep pace with the forecast.

Building electrification in Los Angeles is relatively easy to forecast because the city is mostly built-out and most of the electrification will be the result of retrofitting existing structures, which is expensive and likely to proceed more slowly than electrification of new construction. Building electrification is a much smaller part of the forecasted demand growth than Electric Vehicles.

NOx emissions in Los Angeles from those sectors studied in the original LA 100 report (buses, light duty vehicles, commercial buildings, residences, the Port of LA, and LADWP generation plants) represented 34% of all emissions in the city in 2012. When fully implemented, the conversion to renewable energy will reduce those emissions to 10% and potentially as low as 4% depending on the case chosen.

Rate impacts of the conversion to 100% renewables was studied in detail in the Strategic Long Term Resources Planning (SLTRP) process. Because of the City's accelerated goal for achieving 100% renewable energy, rates are expected to rise rapidly from about 20 cents/kWh today to a range of 54 to 58 cents/kWh by 2035, depending on the case chosen. The average annual rate increase needed would range from 7.7% to 8.4% between 2022 and 2035. In contrast, the base case (SB 100 mandate) would require annual rate increases of only 4.8% between 2022 and 2035, and only 3.3% between 2022 and 2045. The rate estimate also shows where rates will be if electrification (and thus increased power sales) does not occur. By 2045, the rate needed without electrification will be 79 cents/kWh vs. 64 cents/kWh with electrification as projected.

The distribution system is located downstream of the bulk generation and transmission facilities and includes sub-transmission at 34.5 kV between receiving stations and distributing stations. Industrial customers and fast-charging stations are fed directly from this part of the system.

Downstream of the distributing stations, the system operates at 4.8 kV and directly feeds commercial and residential customers. Electric vehicle charging stations located in residences and commercial office buildings are fed from the 4.8 kV system. The goal is to provide 3,000 fast charging stations, each with a capacity of around 1 MW. The existing 4.8 kV system cannot accommodate this additional demand, so the chargers will connect to the 34.5 kV system.

Currently, 60% of the total load is supplied from the 4.8 kV system. That is expected to change as electrification proceeds and larger commercial/residential complexes are built resulting in a shift in load to 34.5 kV. However, in the 34.5 kV system, 1 out of 20 receiving stations and 14 of 532 circuits are currently overloaded. In the 4.8 kV system, 17 of 123 distributing stations and 321 of 1,617 circuits are currently overloaded. Thus, a significant amount of system upgrades is needed to relieve these overloads in addition to expansions and additions to accommodate load growth. To attenuate further overloads, LADWP is now collaborating with the installers of vehicle charging stations to identify geographical areas where excess capacity is available.

Distribution load forecasts predict a 5-fold increase in the contribution to peak loading due to electric vehicle charging between 2021 and 2030. LADWP is planning on using both passive and active demand management strategies to incentivize charging during off peak hours.

Examples of each include a time-of-use rate structure, and an existing feature on all electric vehicles that allows the power utility to communicate directly with those vehicles to decrease their charging rate to reduce load on the distribution system.

Much of the needed upgrades and expansion of the distribution system will be accomplished by leveraging the Power System Reliability Program (PSRP) which addresses overload relief and future growth in demand. Key initiatives will include upgrades to distributing and receiving stations, converting the voltage of portions of the 4.8 kV system to 12 kV, and implementing new circuits for projected demand. Voltage conversion studies have been ongoing for the last two years. One option considered was to upgrade the entire distribution system to 34.5 kV. However, the challenges and costs facing a 34.5 kV conversion are greater than those facing a 12 kV conversion. The voltage conversion program will begin with a 3- to 4-year pilot study at DS-74 in the West Valley. Systemwide deployment will take place between 2030 and 2040.

GUESTS OF THE MONTH  
MAY 2023

Sabrina Tsui, Manager of Water Resources Development and Watershed Management, and Water System managers Ben Wong, Chad Lamacchia and Tyler Kaplan

A COMPREHENSIVE UPDATE ON ANTICIPATED WATER SUPPLY CONDITIONS FOR THE CURRENT YEAR AND CONSEQUENCES OF THE HISTORIC PRECIPITATION OF THE PAST WINTER

**Sabrina Tsui:** As a result of that record breaking precipitation, water supply conditions have shifted from extremely dry late in 2022 to extremely wet today. Total precipitation in the three watershed areas supplying water to southern California assure a plentiful water supply for the upcoming year. Snow accumulation in the SWP watershed peaked on April 9 at 59.1 inches of water content, that represents 199% of the April 1st average. In the LA Aqueduct watershed, snowpack peaked on April 4 at 68.1 inches of water content, representing 301% of the April 1<sup>st</sup> average. On the Colorado River, the snowpack peaked on April 7 at 23.9 inches of water content representing 165% of the April 1st average.

Based on these snowpack data, LADWP is predicting more than 1 million AF of runoff from the LA Aqueduct watershed which is 230% of a normal year. Likewise, on the SWP, the allocation to its contractors will be 100% this year, which hasn't happened since 2006 and will result in the delivery of 1.9 million AF to MWD.

The outlook for the Colorado River is also vastly improved with the predicted end-of-year elevation of Lake Mead now at 1,068.05 ft. compared to the January prediction of 1,026.91. The current prediction is more than 41 ft higher than the earlier prediction, however, it remains below the trigger point for a tier 1 shortage condition and does not resolve the dire situation that has developed over the last 23 years. The problem is caused by over allocation of Colorado River water rights in the Law of the River compounded by a 23-year drought that is the worst in 1,200 years. The situation could suffer more after the expiration of the 2007 Interim Guidelines at the end of 2025. Negotiations to replace those interim guidelines have been ongoing and are focused on a long-term solution to the problems mentioned above. (See article on Page 6)

**Ben Wong:** Water demand conditions have been heavily influenced by the recent drought that severely affected the State of California for more than three years prior to this winter. Since April 2022, the percentage of California in some level of drought has been reduced from 95% to zero in April 2023.

The drought exposed vulnerabilities in supply to certain parts of the MWD service area that can only be fed from SWP. In response, MWD imposed an emergency water conservation plan that allowed for two paths: 1) Path 1 limited outdoor watering to one day a week initially with the provision to reduce it to zero if needed, 2) Path 2 imposed a volumetric limit on a member agency's monthly water use with severe financial penalties for exceeding the limit. DWP chose Path 2 and imposed phase 3 water use restrictions to successfully avoid exceeding the limit.

DWP recently reverted to phase 2 restrictions in response to the excellent water supply conditions, but demand has not recovered to levels seen before the drought. Furthermore, demand is projected to remain depressed due to the enduring nature of changes brought about by the conservation programs such as turf replacement.

Several longer-term programs are in effect to increase water supply quantities and reliability in the future. Water banking in groundwater basins is being used both on the LA Aqueduct and by MWD. Conservation and water use efficiency programs will further reduce water use and ultimately reach a goal of 43 gallons per capita per day (residential use) by 2035.

Stormwater capture programs yielded 125,000 AF in the most recent water year. Future programs will increase that yield to 150,000 AF/yr. Groundwater treatment plants will soon be completed to maximize groundwater availability. The purple pipe program provides treated wastewater for irrigation uses and groundwater replenishment in many parts of the city. Finally, Operation NEXT will ultimately recycle the full output of the city's Hyperion Water Reclamation Plant.

**Chad Lamacchia (Aqueduct Operations):**

The magnitude of this winter's storms can be illustrated by the observed flows at Rock Creek. In 2017, the previous wettest year, flows peaked twice at just under 300 cubic feet per second (cfs). In 2023, it peaked once slightly above 300 cfs, once at 450 cfs, and during the biggest storm, at an estimated 1,100 cfs! This flow is an estimate because some of the flow bypassed the measuring flume. Nevertheless, it significantly exceeded the previously measured highest flow rate.



Total precipitation for the year exceeded the previous wettest year by nearly 20 inches of water content. Snowfall in the month of March exceeded the average amount in an entire year. As a result, the predicted total runoff for this summer is the highest ever at 1.2 million AF from the Mono and Owens River basins combined. After deducting Owens Valley water uses from the total, the net outflow from South Haiwee Reservoir to Los Angeles will be 410,000 AF.

**Tyler Kaplan (Aqueduct Operations):** The record snowfall resulted in significant damage to many DWP facilities in the Owens Valley that required a monumental effort to repair and to prepare for the record runoff that is expected this summer. Examples of damage sustained include:

- Mud flows into the Aqueduct and tributary ditches;
- Access road washouts;
- Damage around measuring flumes that overflowed causing pathways that enabled creek flows to bypass them (20 to 30 such flumes affected);
- Breach of 140' section of Aqueduct near Olancha.

Repair of such damage required supplemental crews from DWP's Fleet organization and crews from other City Departments, who, in the case of the Aqueduct breach, worked around the clock to finish the repairs before the next storm arrived. Photos from the archives taken during the 1969 water year show similar damage except the dates of occurrence were in late July when runoff peaked. Thus, similar additional damage is likely to occur in a few months when snowmelt flows reach their peak.

Preparations are also underway to redirect Aqueduct and Owens River flows by spreading or increasing storage in Crowley Lake using flashboards to add 3 feet of elevation. Approval of the use of flashboards by the State's Division of Safety of Dams is pending. This is needed because peak flows in the river are expected to top 2,000 cfs which will overwhelm the 700 cfs capacity of the Aqueduct south of Haiwee reservoir and force spilling into Owens Lake. Avoiding such spillage is a high priority to protect the multi-billion-dollar investment in dust control facilities there.

**Marty Adams, General Manager and Paul Habib, Executive Assistant General Manager**

## **STATE OF THE DEPARTMENT OF WATER AND POWER**

### **Capital Program Funding**

Because of the unprecedented amount of capital funding that will be required to build the proposed renewable energy and recycled water projects, the Department is actively and aggressively seeking state and federal grant funding to defray as much of the cost of those projects as possible. Given the size of the capital program for both Power and Water System initiatives, it is unlikely that either can be completed without significant rate impacts, absent meaningful funding from outside sources. Additionally, changes in administrative processes and organizational structure are being made to support and centralize the grant procurement effort.



### **Commitment to Renewable Energy Goal**

Regarding the 2035 goal for achieving a conversion to renewable energy and accommodating the demand growth associated with electrification of transportation and buildings, the Department is fully committed to achieving the goal. However, it is also facing a plethora of unknown factors, most of which are beyond the control of the Department. Furthermore, the ability to accomplish the goal depends on the Department's ability to pay for it. Because of the political sensitivity to rates and the emphasis on affordability, the likely need for rate increases must be offset by a restructuring of rates to achieve equity and fairness to all ratepayers. As it stands, the existing rate structure shifts costs to those who can least afford it.

The Department will push ahead to achieve its renewable energy and electrification goal unless or until affordability issues dictate otherwise. The Department is confident it can achieve 80 percent of its goal by 2030 at which time a broad reassessment of the timeline for 100 percent achievement is logical, taking into account a number of social, economic, and environmental factors. The question then will be what is the cost of the last 20 percent, how does that change if the timeline is extended, and is the cost of the 20 percent justified by its benefit? The mayor has underscored that affordability for every aspect of government service is of utmost importance.

### **Clean Hydrogen**

The Intermountain Power Project (IPP) conversion to hydrogen is proceeding and is on schedule to start up in 2025 with a 30 percent hydrogen fuel blend. The construction of hydrogen storage caverns is also proceeding on schedule literally across the road from the IPP.

The in-basin Scattergood Power Plant's conversion to hydrogen is also moving ahead. The Department is committed to "green" hydrogen and has issued a Request for Proposal for a contractor to develop the concept and is already aware of viable options for green hydrogen generation.

DWP has also applied for federal funding through ARCHES (Alliance for Reliable Clean Hydrogen Energy Systems) to make Scattergood part of a regional hub for clean hydrogen

generation and distribution to locations such as the Harbor for their on-site uses. Air Products & Chemicals, Inc. already has 60 miles of hydrogen pipelines in the Harbor area including one that passes near Harbor Power Plant. One goal of ARCHES is to create a robust hydrogen market in California that will ultimately make hydrogen competitive with natural gas as a fuel for power plants, heavy transportation, and industrial uses. Harbor Power Plant is of particular interest because some of its newer units already have the capability to burn a 30% hydrogen fuel blend (with natural gas). Furthermore, to retain the reliability of the power grid, it is necessary to maintain a high level of generation capacity (using hydrogen fuel) at the existing four in-basin plants.

### **Public Charging Stations**

There are currently 27,000 rapid charging stations in the City of Los Angeles which have already proved insufficient for the rapidly growing private fleet of electric cars. Waiting lines at chargers are common, and people are offering others money to move ahead in line. Ultimately about 125,000 charging stations will be needed when all cars are electric.

### **Water System Projects**

The water system has made significant progress in implementing its infrastructure replacement program, which is an ongoing effort to replace aging distribution pipelines, trunklines, and appurtenances. The Water Quality Improvement Program which was created to comply with the Safe Drinking Water Act is finally done with the recent completion of the second UV disinfection plant below LA Reservoir. The two UV plants (Pankaj Parekh UV Plant at the LA Aqueduct Filtration Plant (LAAFP) and the new LA Reservoir Plant) are, respectively, the third and second largest UV plants in the US (New York is first).

Three groundwater treatment plants in the North Hollywood area intended to remove industrial contamination are nearly complete. A stormwater capture project at Tujunga Spreading Grounds constructed jointly with the Los Angeles County Flood Control District (LACFD) was recently completed that will double the spreading capacity of that facility. By agreement, LACFD will operate the spreading grounds and all water added to the groundwater basin will be DWP's. A similar but smaller project is underway at Pacoima Spreading Grounds as well, so the focus on stormwater capture is yielding results. Additionally, a water reclamation project at Tillman Water Reclamation Plant is moving forward and will produce a substantial amount of additional water for spreading at Tujunga Spreading Grounds.

Operation NEXT is a high-profile project that will ultimately recycle all the effluent from the City of Los Angeles' Hyperion Reclamation Plant for both indirect potable (groundwater replenishment) and direct potable uses (after treatment at the LAAFP). It has drawn great interest from City leaders because of its size and ability to mitigate water shortages in severe droughts. However, at this stage of development, many issues are under discussion regarding the structure of the project that would result in the least cost to build. One significant issue is whether to treat all of the water to a direct potable use standard at Hyperion, or to treat to a lower indirect potable use standard and build satellite plants to provide additional treatment for direct potable uses downstream at the points of use (e.g. LAAFP).

Another issue of significance is how to move the treated water to those points of use. One consideration that is drawing interest is to re-purpose underutilized pipelines to convey the recycled water rather than build expensive new large pipelines, such as collaborating with Metropolitan Water District of Southern California (MWD) to use their existing but little-used Sepulveda Feeder to move some of the treated water northward to the Valley and to LAAFP. Also, because MWD is concurrently planning its Pure Water Program to recycle the effluent from the County's Joint Water Pollution Control Plant, there will be opportunities to share distribution piping to reduce costs for both agencies.

## **Mono and Owens Valley Issues**

The Department's historic sources of water in the Mono Basin and the Owens Valley continue to face challenges from the environmental community for the familiar reasons we have been dealing with seemingly forever. In the Mono Basin, the Mono Lake Committee (in opposition to DWP) has requested a public hearing on all Mono Lake issues to stop DWP from exporting any water from the basin and restore Mono Lake to the condition it was in before DWP diverted the lake's tributaries.

The Great Basin Air Pollution Control District (GBAPCD) recently filed a lawsuit to compel the Department to apply a non-approved dust control method on tribal lands near Owens Lake. Such a demand is outside the scope of the settlement agreement with the GBAPCD and has no relationship to the Department's activities on the Lake or elsewhere in Owens Valley. DWP fought and won that lawsuit and a subsequent appeal.

## **Staffing Issues**

The huge capital programs in both the Water and Power systems will require significant additional hiring. DWP is using a strategy to hire more personnel than vacancies would dictate in a few critical classes and absorb additional staff into the organization to prepare for the workload explosion that is expected in the coming years. Recent pay increases have helped DWP to achieve parity in high-demand job classes with competing employers. As a result, certain employees such as linemen have returned to the Department recently.

Staffing shortages in certain critical classes continue to challenge management. As part of the planned renovation of the John Ferraro Office Building, the Department is considering "restacking" the layout for more efficient use of space in general and to accommodate more staff. Such an effort will require temporarily relocating employees to other sites while renovations are taking place. The Department has leased and created office space nearby and is seeking other available office space for this purpose.

## **CAISO & The Energy Imbalance Market**

The Department's participation in the state-wide energy imbalance market has been highly successful and beneficial. DWP's ability to manage and store excess energy has made that participation profitable and has benefited its customers. It is notable that the Department's Castaic Pumped Storage System is the nation's second largest energy storage facility.



### ***Mystery History Answers***

Sawtelle Reservoir and Bel Air Golf Course

More information at:


[https://waterandpower.org/museum/Mystery\\_History.html](https://waterandpower.org/museum/Mystery_History.html) or Click [HERE](#).

# SAVE THE DATE

2023 CALENDAR

## GUEST OF THE MONTH

Meetings in Person  
Room 1471, JFB and Via  
Zoom, Check your WPA  
Emails for the Zoom Link



JASON RONDOU DIRECTOR, POWER SYSTEM PLANNING	APRIL 12, 2023 LADWP's Planned Power Distribution System Upgrades
WATER SYSTEM REP TBD	MAY 10, 2023 LA Water Supply Outlook For This Year And Beyond
LADWP MANAGER TBD	JUNE 14, 2023 Current Issues Facing LADWP
SPEAKER TBD	JULY 12, 2023 Topic TBD

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