



JULY 2021



WATER & POWER ASSOCIATES, INC.

# NEWSLETTER

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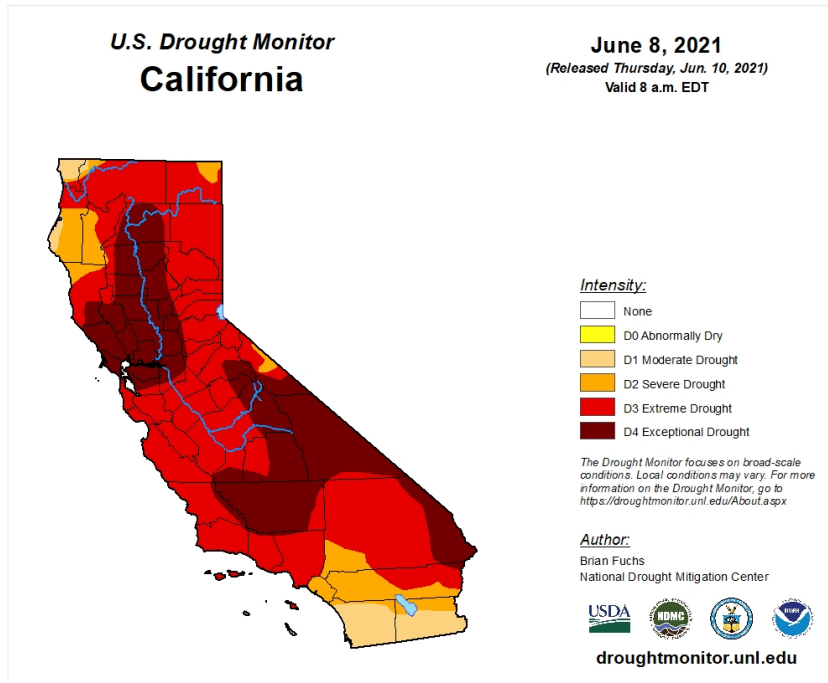
For a Sustainable Los Angeles



## The Emergence of a New Drought and Its Impact on Southern California

By Robert Yoshimura

A little more than two years ago in March 2019, the National Integrated Drought Information System (NIDIS) officially declared an end to the longest (7+ years) and most severe drought in California history. Unfortunately, the end of the drought was followed by just one year (2019) of higher-than-normal precipitation before another dry year engulfed the state in 2020 followed by a severely dry year so far in 2021. Furthermore, in 2021, areas in exceptional drought have recurred for only the second time in the 21-year time frame of the chart below and the percentage of areas in extreme drought now approach the levels of the worst years of the last drought.



In response to these conditions, Governor Gavin Newsom on May 10, 2021, declared a drought emergency affecting 41 of the state’s 58 counties. Most of the affected counties are in Northern California and the Central Valley where the drought-diminished supplies will be insufficient to fulfill the water demands of those regions. Notably, none of the declared counties are in Southern California. Why that is so will be the focus of the remainder of this article. However, before we can begin such an analysis, it is important to understand how the State defines drought. From the website of the California Department of Water Resources, drought is defined (in part) as follows:

“Defining drought is based on impacts to water users. California is a big state and impacts vary with location. Hydrologic conditions causing impacts for water users in one location may not represent drought for water users in a different part of California, or for users with a different water supply. Individual water agencies may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions”.

(Continued on page 3)



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## Editor's Column

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While drought issues are facing water supply primarily for Northern California, in Southern California the investments that have been made in infrastructure and water conservation have allowed us to have storage to assure adequate supplies for this year. Thus, the primary focus of this issue will again emphasize energy issues.

The Mayor has established a goal of having Los Angeles provide 100% of its electrical energy through "Green Power" by 2035. This is a potentially achievable goal as shown in the recent LA100 report. Refer to the abbreviated summary of that very detailed report on page 7.

However, it is a very aggressive goal in the terms of the technology advances and the amount of investment that will be required to achieve it. In future newsletters we will be going into these issues in greater detail. To stay on top of these issues you should go to the LADWP website: [www.ladwp.com/la100](http://www.ladwp.com/la100)

Included is a letter from the W&PA, addressed to Mayor Garcetti and also sent to other City Leaders, regarding the W&PA position on the goal of getting to "100% Green Power".

We also have Summaries of the presentations at our recent Board of Director's meetings including by Reiko Kerr, Senior Assistant General Manager – Power and Jason Rondou, Manager of LA100 Program on issues facing the Power System and from Delon Kwan, Assistant Director of Water Resources on the LADWP 2020 Urban Water Management Plan and other water issues.

There is also our popular Mystery History feature. See how you do on this one. Enjoy

*Jerry Gewe, Editor*

PS: If you enjoy this issue, please pass it on to others who might benefit from it and consider joining the WPA using the application on page 19.

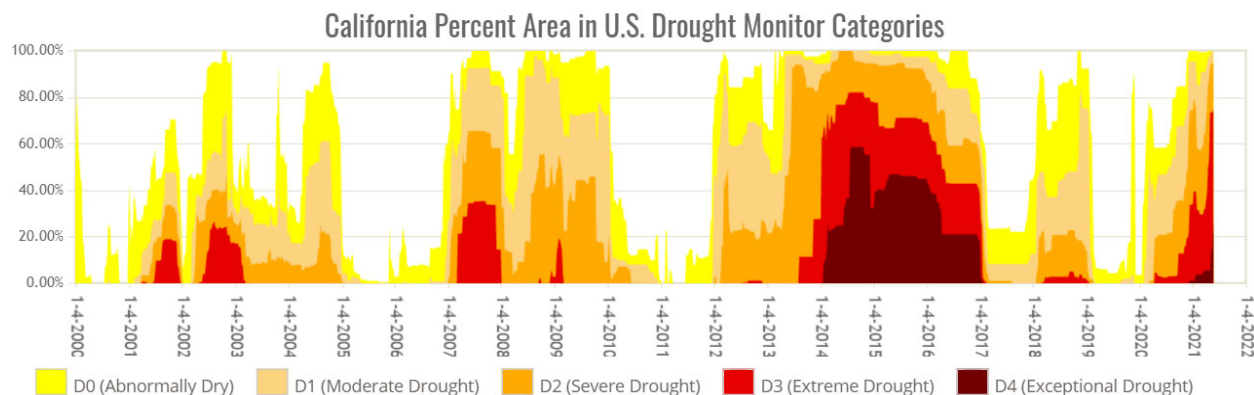


(Continued from page 1)

The State's definition focuses on impacts to water users. In contrast, the U.S. Drought Monitor (originator of the graphics shown below) focuses on local environmental conditions such as precipitation, soil moisture, streamflow, etc. to define the intensity of drought within any given area. Thus, the intensity of drought may not reflect impacts on water users if a given area is well equipped to endure a drought because of aqueducts from faraway places and large storage reservoirs incorporated into their water systems.

It is also important to understand that Southern California will receive only 5% of its contracted amount of water from the State Water Project (SWP) in 2021 which is normally a major source of supply. Despite the near absence of that supply source and the dearth of rainfall in the region, the impacts of the drought on southern California water users will be minimal primarily because of strategic investments made in programs and infrastructure over the last half century that greatly improve water supply reliability in the driest and most populous part of California. The Metropolitan Water District of Southern California (MWD), the region's primary water wholesaler, reported the highest level of water storage in its history at the beginning of 2021. That amount of storage was made possible by the availability of reservoirs and groundwater basins in which to store that water and conservation and reuse programs throughout southern California that created the excess water stored.

Many local water agencies (such as LADWP) have also invested in their own conservation programs and incentives, as well as reuse projects, stormwater capture, and groundwater cleanup. Additionally, MWD has engaged SWP and the Colorado River Basin states and the federal government in agreements to allow excess water to be stored in San Luis Reservoir and Lake Mead. These are some of the reasons why Southern California was not included in Gov. Newsom's drought emergency, and why MWD believes it can endure another two years of drought, where most northern California agencies would be hard pressed to endure just one.



These observations underscore the importance of a statewide effort to expand water infrastructure, conservation programs, water recycling projects, groundwater management programs and other efforts to reduce demand and improve year-to-year water supply reliability throughout California. They also confirm the value of the investments made by southern California water agencies particularly in conservation programs and infrastructure that enable water supply reliability through a drought.

Much of the data for this article was derived from the U.S. Drought Monitor which is produced by a partnership between the National Drought Mitigation Center at the University of Nebraska – Lincoln, the U.S. Department of Agriculture, and the National Oceanic and Atmospheric Administration.

# Cooking with Electricity

By Alice Lipscomb as summarized by  
David Oliphant

Alice Lipscomb, retired Home Economist, was a member of the LADWP Home Economics Staff which between 1950 and 1980 advised all-electric homeowners and others on the use of electric ranges, ovens, refrigerators, and home appliances. This article is a discussion of the Staff's home service activities, educating the Los Angeles community on the most efficient use of electric appliances, with hints still useful today.

It is the goal of the City of Los Angeles and the State of California to combat climate change under SB100\* by requiring Los Angeles consumers to use electricity generated solely from 100% renewable energy sources by the year 2045.\* That means the use of fossil fuel for cooking, including gas, may well be verboten by 2045, replaced wholly by electricity. So, those of us who are used to cooking with gas will need to get used to cooking solely with electricity by 2045. In our April newsletter, we discussed the nationwide effort by electric utilities in the 1950's to encourage the construction of all-electric homes with the Gold Medallion Home awards. Remember the all-electric kitchen in the Disneyland 1957 House of Tomorrow and the slogan "Live Better Electrically." In this article, we share Alice Lipscomb's experiences as a former LADWP Home Economist, explaining how the LADWP Home Economics Staff from 1950 to 1980 helped the Los Angeles community become familiar with successfully managing an all-electric kitchen and electric home appliances generally.

In the LADWP Commercial Building's auditorium and display area at 4030 Crenshaw Boulevard, the LADWP Home Economics Staff worked with and scheduled programs for electric appliance dealers to demonstrate the use and care of the latest electric cooking ranges, ovens, refrigerating and laundry appliances, and other electric home products. Similar presentations were made in other DWP display facilities including those in San Pedro and the San Fernando Valley. Area appliance dealers from companies like General Electric, Frigidaire, Thermidor, Westinghouse, RCA Whirlpool, and Waste King brought in the newest electric



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Members and guests are invited to our monthly Board Meetings, via Zoom, at 10:00 am on the Second Wednesday of the month. Please send us a request at [comments@waterandpower.org](mailto:comments@waterandpower.org) to get the link.

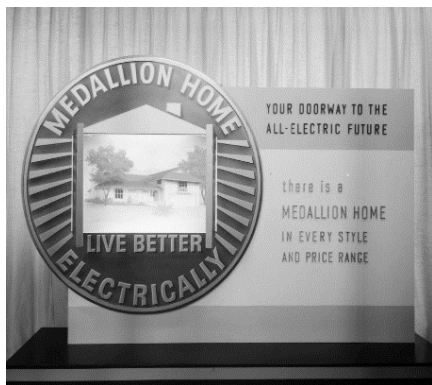
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Interested in becoming a member? You can join via our website, [waterandpower.org](http://waterandpower.org), or by returning the application on page 19.

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The Los Angeles Water and Power Associates, Inc. is a nonprofit, independent, private organization, incorporated in 1971 to inform and educate its members, public officials and the general public on critical water and energy issues affecting the citizens of Los Angeles, Southern California and the State of California. Our secondary mission is to preserve the regional history of water and electricity and show its role in the development and growth of the City of Los Angeles. Also, to disseminate knowledge of the rich and diverse multicultural history of the greater Los Angeles area; to serve as a resource of historical information; and to assist in the preservation of the City's historic records.

appliance models, and assisted by the manufacturer's home economist, the Home Economics Staff would demonstrate the advantages of the latest products. Attending consumers filled out information cards which made them available for up-to-date information from LADWP and dealers about electrical appliances, answers to consumer questions, informational booklets, and recipes. Demonstrations included cooking a variety of entrees, hors d'oeuvres, side dishes and desserts, with some of the completed information cards selected at random for lucky consumers to take home the cooked meals after the show. In addition to demonstrations, the Home Economics Staff also provided recipes for portable electric appliances including microwave ovens, portable electronic ovens, and electric meat rotisseries, among other cooking devices.



Five-day annual seminars were conducted for Los Angeles public school and home economics teachers including demonstrations and distribution of recipes. Among some of the subjects presented were the basics of choosing an electric range, skills of using an electric range and oven, microwave cooking, use of electric laundry washers and dryers, use of water softeners, developing electric ironer skills, use of freezers in meal planning, and understanding the use of electricity in the home including how home electric ranges and ovens

operate, measurement of circuit capacity, kind of circuits needed for various appliances, and the use of fuses and circuit breakers.

The public and teacher demonstrations were popular, well-attended, and frequently attending groups rebooked them and requested new presentations. In addition, dealers would send the LADWP names of people who needed help in using electric appliances. Home Economists then followed up, making house calls during which they cheerfully showed a new owner how to use, care for, and enjoy a new electric range, teaching proper pan placement, heat settings, work with heating temperatures, and so forth, all to ensure the best results. See below woman demonstrating use and cleaning of electric range coil.

LADWP Home Economists would explain to customers new to using electric stoves the advantages of using electricity. For example, the difference between using electric stoves and gas ranges included demonstrating the advantage of using "retained heat." Using "retained heat," allows a homeowner to adjust a recipe to save energy and costs. If the recipe says to cook for a set time for example, the cook may be able to switch the range on for a shorter time, depending on the stove, because the heating element will stay hot for a period after the power is switched off, allowing completion of cooking using "retained heat" at no additional cost or energy.

Many a new electric stove user has discovered that, though a burner is no longer red, until cooled it remains hot enough to burn a wayward hand. So, modern electric stoves frequently have a warning light that remains on until the used element is safely cool. Most modern electric ranges



This is from the Huntington collection.  
 "(1962) - Women demonstrating use and cleaning of electric range coils in teaching kitchen of an electric living center."  
<https://hdl.huntington.org/digital/collection/p16003coll2/id/66907>

have numbered dials with graduated temperature control or levels listed such as simmer, low, medium, and high to maintain precise cooking control. In addition, most electric stand-alone cooking appliances, e.g. toaster ovens, microwave, convection, radiation and induction cookers, frequently can heat and cool faster and often cheaper than gas, and may cool down as fast or faster. Today, it may be worth checking out stand-alone appliances, many advertised on television, e.g. pressure cookers, New Wave ovens, Instant Pots, etc., for additional cooking resources.

Home Economists explained the advantages of electricity over gas. Electricity is cleaner and safer to use. Gas grates can become covered with food and grime and may release methane and particulate matter into the air. Gas appliances require the assistance of a professional for installation, requiring additional costs, not necessarily true of electric appliances which can usually just be plugged in to an existing wall outlet. Electricity has no danger of being extinguished by breeze through an open window, or toxic gas released through a leaking pipe or appliance such as an aging wall heater. Thus, with electricity, there is no danger of carbon monoxide poisoning. And today, electricity generated from non-fossil fuel sources satisfies the intent of City and State legislators to use “green” power to combat climate change.

Electricity, through refrigerator and freezer, makes planning and organizing meals in advance a time and energy saver. With rules of Covid 19 now easing, many will once again be working away from home in an office, plant, or store, where there are advantages the Home Economics Staff taught in preparing meals in advance for storage in the freezer for the week and/or special occasions ahead. The Home Economics Staff recipes included evening meals prepared for an entire week ahead to be kept in the freezer or refrigerator for use during the week. Using small electric appliances like a crock pot, the homeowner can put meals on to simmer in the electric cooker during the day, instantly ready to eat at night.

The DWP Home Economist advised that better cooking results from choosing the right pots and pans for electric cooking. For example, electric ranges work better when the pots used are best shaped to match the heating elements. Flat bottom utensils that fit flat heating elements of the same size and shape with straight as opposed to slanting sides on the utensils allow uniformity of heat to spread evenly throughout the pot. When using a pan, if the pan is too small, electricity used to heat that part of the cooking element outside the pan is wasted and if the pan is too large, more energy is needed to heat the part of the pan outside the cooking element resulting in energy loss and additional time needed in cooking. Proper sizing of pans therefore conserves energy usage, helps the environment, and is safer.

In 1980, the LADWP Home Economics Staff was disbanded, the Home Economists transferred to the DWP Public Relations section. It may be that the use of Home Economists to educate homeowners in ways to conserve and manage electric appliances more efficiently would be a useful function to bring back, particularly if smart meters become part of every household.

\*“The 100 Percent Clean Energy Act of 2018,” Senate Bill 100 (SB 100, De León): Sets a 2045 goal of powering all retail electricity sold in California and state agency electricity needs with renewable and zero-carbon resources — those such as solar and wind energy that do not emit climate-altering greenhouse gases.

# LA100 Study Summary and Update

By William Barlak

On May 5, 2018, the Department entered into a \$14 million contract with the National Renewable Energy Lab located in Golden, CO to determine the feasibility of the Department transitioning to a 100% renewable energy provider by 2045 (or even earlier), while maintaining its current high level of reliability. This feasibility study was named the LA100 Study. Almost three years later, on March 23, 2021, LA Mayor Eric Garcetti shared NREL's final results with City and Department leaders which showed the transition is feasible but is heavily dependent on critical new technologies assumed by the Study being available in time. In this article, we will present the main findings of the LA100 Study. But first, a few facts about the Study will prove illuminating.

NREL immediately realized how challenging looking 25 years into an uncertain future was going to be. It was faced with the task of performing an analysis of a 21st Century renewable power system with 20th Century utility planning tools. NREL developed new tools and modified existing ones to better represent future outcomes. For example, NREL first explicitly modeled 80% of individual rooftops in the City of Los Angeles to assess the likely build-out of photovoltaic solar panels on residential and commercial rooftops, and then modeled most of the Department's 4.8kV and 34.5kV electric distribution networks to determine how these networks will have to evolve to accommodate various degrees of additional solar production. Also, NREL used a super-computer to run millions of simulations to evaluate on an hourly basis for five different future years how the Department could most efficiently use various combinations of renewable resources while maintaining reliability in energy supply and transmission. The LA100 Study is indeed the first of its kind.



The Study was guided by an Advisory Group (AG) comprised of LA citizens with expertise in power systems, policy, transportation, economic development, energy systems, and sustainability.

As stated in the Study's Executive Summary, "The Advisory Group includes representatives from environmental groups, neighborhood councils, academia, customers, city government, business and workforce groups, and renewable energy industry organizations. Its role is to guide the LA100 study in understanding and planning for issues related to feasibility, reliability, public health, and equitable local economic development, including job opportunities and local hiring programs."

The AG developed four pathways (called Scenarios) to a 100% renewable future that NREL would evaluate to estimate each Scenario's effect on cost, changes to the grid, reliability, jobs, local economy, air quality, health, and environmental justice. These following four Scenarios were intended to address four possible futures for the Department.

1. The SB100 Scenario aims to achieve 100% clean energy by 2045 and allows 10% of energy to be supplied by natural gas to be offset by renewable energy credits.
2. The Early & No Biofuels Scenario aims to achieve 100% clean energy 10 years sooner than the other three and allows no generation from natural gas or biofuels.
3. The Limited New Transmission Scenario is the only one that allows no new transmission construction other than that already planned.
4. The Transmission Focus Scenario prohibits natural gas-fired generation but allows new transmission corridors.

In addition, two (three in the SB100 case) different levels of customer electric demand were assumed for each Scenario to provide the widest range of assumed future conditions allowed by the Study scope, schedule, and budget.

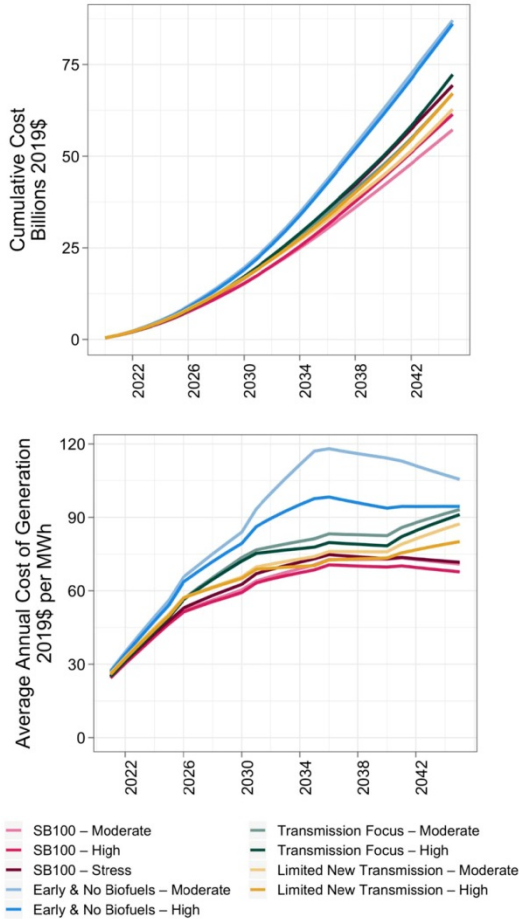
In performing the analysis, NREL intentionally did not state which of the four pathways to a 100% renewable future was preferred. Rather, the goal of the study was to provide an accurate and technically based estimate of the changes and costs associated with each pathway. As NREL states in its Executive Summary, “The goal is not to predict outcomes or to provide a detailed plan that identifies specific project sites and their costs, but to allow Angelenos to make long-term policy goals informed by a better understanding of both feasibility and costs and benefits.”

The Study found several key findings common to all Scenarios.

1. It is feasible for The Department to become a 100% renewable energy provider.
2. Utility-scale wind and solar installations with battery storage, and local rooftop solar can reliably provide between about 80% and 90% of the Department’s annual energy, depending on the Scenario.
3. Local communities currently experiencing negative environmental effects of electric power generation can expect to see improved air quality and improved health conditions, but changes to the Department’s energy supply should intentionally consider how these changes will affect these communities.
4. To maintain the Department’s current high degree of reliability, new in-basin renewable firm capacity must be built. This capacity must be able to come online in minutes and run for weeks. Looking into the future from today’s perspective, combustion turbines are the preferred technology to provide this firm capacity.
5. Fueling this firm capacity with biofuels offers a transition away from natural gas until hydrogen-fueled firm capacity becomes widely available. If a widespread hydrogen supply infrastructure does not develop, the Department could locally create and store hydrogen fuel with excess renewable energy that usually occurs during the Spring when solar output is very high, but customer demand is low. This hydrogen could then fuel firm capacity during periods of high demand, reduced renewable production, and during emergencies such as earthquakes, fires, or transmission failures.
6. Decarbonizing electric supply will allow increased electrification of buildings and transportation that will decrease greenhouse gas emissions, improve local air quality, and increase electric demand, the additional revenue from which will help pay for the transition.



7. The Department’s transmission and distribution networks must be significantly upgraded to accommodate increased customer rooftop solar, increased renewable energy imported from locations external to the LA Basin, and the decreased generation from local thermal generating stations.



While the above factors are common across all Scenarios, Scenario costs are not. While the costs to reach 80% to 90% renewable supply over all Scenarios are very similar, the costs to provide the “final” 10% to 20% diverge depending on Scenario. In general, the sooner the 100% renewable target is reached, the higher the cost. The cumulative cost between the years 2020 and 2045 for the SB100 Scenario in which 10% of annual energy can be supplied by natural gas is \$57 billion; the cumulative cost for the Early & Biofuels Scenario that reaches 100% by 2035 and in which natural gas generation is not allowed, is \$87 billion. When comparing these two Scenarios, the cost of accelerating the goal by ten years increases the cost by more than 50%. The increased cost is related to the need to procure renewable firm capacity (the “final” 10%) without a biofuel transition ten years sooner in the Early Scenario than in the SB100 case.

While not recommending a particular pathway, the Study does recommend some immediate action common to all Scenarios that are characterized as “non-regret”. For example, offering demand response options to customers can decrease emissions while maintaining reliability. Beginning investment in wind, solar, and energy storage both internal and external to the LA Basin coupled with available flexible AC transmission technologies can increase renewable energy production while maintaining reliability. Moving forward, the Study also provides a

context within which future technical advances in renewable energy can be assessed and costs and benefits evaluated. The Study also stresses the importance of continued analysis of customer demand in the areas of efficiency, electrification, demand response, and customer solar and storage.

In response to direction from City leaders, the Department recently concluded the Clean Grid LA Study which is an internal assessment of how to reach a 100% renewable future. CGLA’s results align very closely to the LA100 results. CGLA found the keys to reaching a 100% renewable goal are:

1. Increase wind and solar installations so that these renewable resources account for 70% to 80% of annual energy;
2. Add 1,000 MW of 4-hour batteries most of which will be sited with wind and solar installations;
3. Upgrade ten transmission circuits by 2030.

In his recent State of the City Address, Mayor Garcetti set an annual renewable energy production goal for the Department of 80% by 2030, and 100% by 2035. While very aggressive, reaching these goals is not without precedent for The Department. Between 1950 and 1960, as LA's post-war population boomed, the Department built three new local generating stations, six new receiving stations, and increased the voltage on all the transmission lines in the San Fernando Valley from 138kV to 230kV. The 1950's decade transformed the Department's power system and provided the infrastructure foundation upon which the City's growth was based. Reaching the Mayor's 100% renewable goal by 2035 will again transform the Department and provide the City's renewable infrastructure of the future.

## Sustainability Buzz

### Renewable Natural Gas Project from Pig Farms in Milford, Utah



A joint venture of Dominion Energy and Smithfield Foods, Align Renewable Natural Gas, completed its first renewable natural gas (RNG) project in December 2020 in Milford, Utah. The Align plant captures methane from waste from a network of 26 local family hog farms under contract for Smithfield and converts it into RNG. At full capacity, the project will produce enough RNG to heat more than 3,000 homes and businesses and reduce annual emissions from participating farms by more than 100,000 metric tons, according to the companies. The joint venture announced plans to invest about \$500 million in

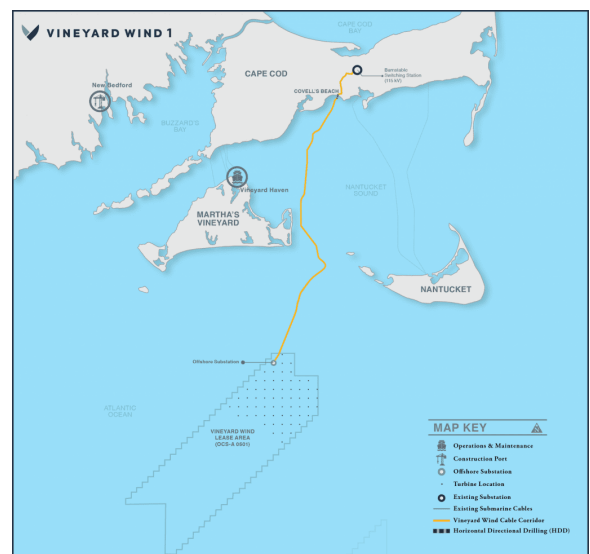
several projects over the next decade. Milford, Utah is also home to Milford Wind, a 306 MW wind farm, for which LADWP is the majority off-taker.

### Offshore Milestone as Feds Back Vineyard Wind Project

The first large-scale offshore wind farm in the U.S. has received the go-ahead from the federal government, with industry insiders saying the milestone decision is likely to spur more rapid development of the nation's offshore wind projects.

On May 11, 2021, the Vineyard Wind installation, an 800-MW project received the Record of Decision from the U.S. Department of the Interior's Bureau of Ocean Energy Management. This is the last major step in the federal review process for Vineyard Wind, a joint venture of Avangrid Renewables, and Copenhagen Infrastructure Partners.

The project has gone through a four-year public review process. The Construction and Operations Plan for the



installation was reviewed by more than two dozen federal, state, and local agencies over the course of more than three-and-a-half years. The project is sited about 15 miles off the coast of Martha's Vineyard in Massachusetts.

The installation will include 62 General Electric Haliade-X wind turbines, each with a 13-MW capacity. The project's turbine layout, which features consistent spacing of one nautical mile between turbines, in an east-west direction, was endorsed by the United States Coast Guard for transit, fishing and navigational safety. Concerns from commercial fisherman about the impact of the wind farm on their industry were among the reasons cited by government officials as they called for an extended environmental review of the project.

The project's developers late last year said they expected to reach financial close on Vineyard Wind in the second half of this year, with commercial operation expected to begin in 2023. The developers reached a transmission agreement with ISO-New England, the regional grid operator, in October, 2020. The first and thus far only commercially operating U.S. offshore wind farm is Ørsted's 30-MW Block Island installation, which is located offshore Rhode Island.

## **International Energy Agency Report, Net Zero by 2050**

In May, 2021, the International Energy Agency published its Flagship report, Net Zero by 2050, A Roadmap for the Global Energy Sector.

<https://www.iea.org/reports/net-zero-by-2050>

This report provides a pathway to the critical and formidable goal of net-zero global emissions by 2050. It is the world's first comprehensive energy roadmap showing how government actions can rapidly boost clean energy, reduce fossil fuel use while ensuring stable and affordable energy supplies, providing universal energy access, and enabling robust economic growth and creating millions of jobs, while keeping net zero in reach. The world has a viable pathway to building a global energy sector with net-zero emissions in 2050, but it is narrow and requires an unprecedented transformation of how energy is produced, transported, and used globally, the International Energy Agency said in its landmark special report. It sets out a cost-effective and economically productive pathway, resulting in a clean, dynamic, and resilient energy economy dominated by renewables like solar and wind instead of fossil fuels. The report also examines key uncertainties, such as the roles of bioenergy, carbon capture and behavioral changes in reaching net zero.



Climate pledges by governments to date – even if fully achieved – would fall well short of what is required to bring global energy-related carbon dioxide (CO<sub>2</sub>) emissions to net zero by 2050 and give the world an even chance of limiting the global temperature rise to 1.5 °C, according to the new report.

The IEA was established in 1974 as the main international forum for energy cooperation on a variety of issues such as security of supply, long-term policy, information transparency, energy efficiency, sustainability, research and development, technology collaboration, and international energy relations. It currently consists of 30 member countries, including the US, and eight association countries.

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### Position on LADWP's LA 100 Study

LADWP has recently published the Final Report of its LA 100 Study which is a feasibility study performed by the National Renewable Energy Lab to assess four possible pathways for LADWP to become a 100% renewable energy provider. Water and Power Associates, Inc. (WPA) has reviewed the Report in detail and offers City Leaders the following recommendations.

WPA conditionally supports the early achievement date of 2035, not withstanding the increased costs and unproven technology, because of the urgency of the situation and proposed governmental mandates. This support is conditioned upon the establishment of metrics to measure the necessary progress towards the goal along with a commitment to revise the goal if the metrics are not being met.

The Study finds that the earlier the 100% target is reached, the more expensive the transition becomes. For example, if the 100% target is reached by 2035, the cost will be 50% higher than the least expensive 2045 pathway because the hydrogen fuel technology and its supporting infrastructure that replaces natural gas may not be fully mature by 2035. Also, prices for solar and battery storage are projected to continue to fall between 2035 and 2045 resulting in a cost savings if the target year is deferred. Furthermore, a 2035 target contradicts the LA 100's environmental justice goal by negatively and disproportionately affecting low-income communities because of the higher cost of energy that will result.

Regardless of the pathway considered, the Study finds reaching about 90% of the energy consumption can be feasibly and reliably met by developing more geothermal, wind, solar, and energy storage sources both

internal and external to the LA Basin. WPA recommends aggressively pursuing these renewable sources. There is a finite number of sites suitable for development that are reasonably close to connection points in LADWP's transmission system, so the sooner the sites are developed, the better. Transmission costs will increase, if the only remaining sites are distant from existing LADWP transmission facilities. Although costs of solar and battery energy storage will almost certainly decrease over time, this cost reduction will likely be offset by increased transmission costs unless LADWP acts quickly.

The Study finds the "final 10%" of annual energy must be met by in-basin hydrogen-based generation, which will require repowering some of the existing natural gas facilities with technology which is not fully proved. This 10% plugs the reliability gaps that renewables cannot fill during times when, for example, winter rains impact and reduce local and external solar or brush fires take out transmission lines. WPA supports the long-term goal of fueling these turbines with hydrogen, but strongly recommends maintaining existing gas-fired generation in the LA Basin as long as necessary to successfully transition to hydrogen. LADWP's local gas-fired generation is one of the main reasons LADWP has maintained its reliability while other areas of the state experienced blackouts.

The Study finds that in order to maintain the current level of reliability, critical upgrades must be made to the existing LADWP transmission system. WPA supports these upgrades and therein lies another reason for keeping local gas-fired generation available as long as possible. Transmission lines must be removed from service to be upgraded, a process that can take several months to complete. The absence of these lines weakens the local transmission system and exposes customers to reduced reliability unless local gas-fired generators remain available.

WPA believes the strategy outlined above will create a new renewable energy system with an acceptable cost, will first tackle the problems involving the longest lead-times such as renewable siting and permitting, and will maintain the high reliability on which LADWP customers have come to depend.

Yours truly,

Gerald A. Gewe  
President, Water and Power Associates

## What's All the Fuss About Natural Gas?

Article 2 in the Series: Back to the Future, Are We Going Back to the All-Electric House?

By William Glauz

The previous and first Newsletter article in this series addressed the history and use of natural gas and electricity in our homes and businesses, laying the foundation for recent efforts by policy makers to convert natural gas uses to electric. Over 40 cities in California have adopted regulations to shift from using natural gas to electricity, primarily in new construction. This includes using electricity for heating and cooling buildings, heating water, cooking and clothes drying. These actions are also known as fuel switching. Outside of California, many other states are developing programs to support fuel switching. However, most states do not have policies in place to support fuel switching, and several states actually have policies that outright prohibit fuel switching. Most of the later states rely significantly on fossil fuel development for their economy.

Why are a significant number of jurisdictions promoting fuel switching? It comes down to the effort to combat human causes of global warming or climate change. To better understand the reasons for these significant policy changes, it is important to understand the role that natural gas use plays in climate change.



Earth's climate is ever changing. The concern that scientists currently have is that we are now seeing a significant acceleration in climate change brought about by human activities, mainly over the last century. The belief is that recent changes to Earth's climate have primarily been caused by changes in the composition of Earth's atmosphere that traps heat, known as the greenhouse effect. Industrial human activity has significantly increased the concentration of particular gases that contribute to the greenhouse effect. These greenhouse gasses (GHGs) include carbon dioxide (CO<sub>2</sub>), nitrous oxide (N<sub>2</sub>O), chlorofluorocarbons (CFCs) and methane (CH<sub>4</sub>).

The impacts associated with climate change are substantial and include:

1. Earth becoming warmer. Some regions may welcome warmer temperatures, but others may not.
2. Warmer conditions will probably lead to more evaporation and precipitation overall, but individual regions will vary, some becoming wetter and others dryer.
3. Oceans will warm, ocean water will expand, and glaciers and ice sheets will partially melt, causing a rise in sea level impacting low lying and coastal regions.
4. Warming ocean water also leads to stronger hurricanes.
5. Climate extremes, such as droughts, floods, and extreme temperatures, can lead to increased wildfires and crop losses.

Methane is a hydrocarbon that is the primary component of natural gas. Methane is emitted from a variety of human-influenced and natural sources. Human caused emission sources include landfills,

leaks from oil and natural gas production and use, agricultural activities, coal mining, stationary and mobile combustion, wastewater treatment, and certain industrial processes.

Methane is the second most abundant human caused GHG after CO<sub>2</sub>, accounting for about 20 percent of global emissions. However, methane is more than 25 times as potent as carbon dioxide at trapping heat in the atmosphere. Over the last two centuries, methane concentrations in the atmosphere have more than doubled, largely due to human-related activities. Because methane is both a powerful greenhouse gas and short-lived compared to carbon dioxide, achieving significant reductions would have a rapid and significant effect on atmospheric warming potential.

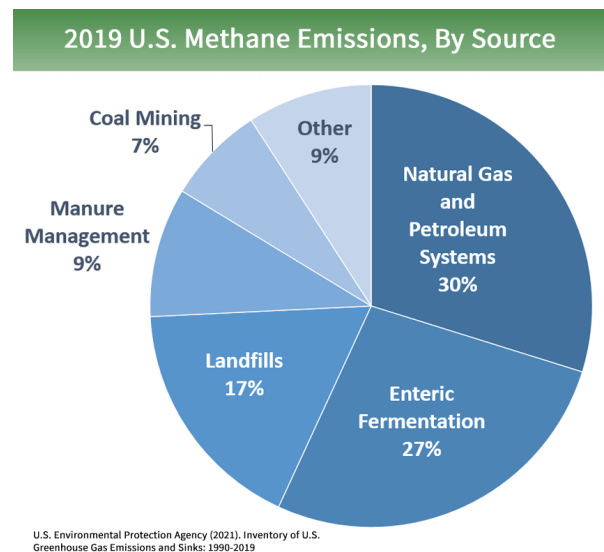
Methane is also emitted by natural sources such as natural wetlands. However, natural sources of methane have not had significant changes over time like human produced methane has. Globally, 50-65 percent of total methane emissions come from human activities. The EPA estimates that about three percent of U.S. GHG equivalent emissions are from the methane emissions from oil and gas production (200 out of 6,600 million metric tons).

This pie chart shows total U.S. methane emissions by source in 2019. Natural gas and petroleum production and use accounts for 30% of human caused methane emissions.

The U.S. electric utility industry has made great strides in reducing CO<sub>2</sub> emissions over the last decade or so. This has primarily been due to fuel switching from coal to natural gas, since natural gas fired electricity produces 50-60% less CO<sub>2</sub> per kwh of electricity than coal. Natural gas use for electricity production has increased 60% since 2005 and currently accounts for about 38% of all natural gas used.

The next major problem to solve is how to reduce methane emissions. One option is to try and reduce leaks, venting and flaring of methane from the extraction, transportation and use of natural gas. Accurate accounting of methane leaks is difficult, but with improved technology, including satellite analysis, it is currently estimated that the leakage rate of methane from natural gas use is between 1.4-3.7%, significantly contributing to the high percentage of GHG emissions coming from natural gas and petroleum systems.

Historically, federal and state regulation of the natural gas industry has not emphasized minimizing the climate impacts of methane leakage. Rather, methane emission reductions from this sector have typically occurred as a co-benefit of policies that target air pollution and improve safety. In general, policy strategies that reduce system leakage also conserve natural gas, which can result in savings for consumers in addition to climate benefits. On the other hand, new regulations can carry administrative costs for governments and investment costs for industry that need to be balanced against fuel savings or other co-benefits.



Regulations being considered or recently put into place for natural gas producers and transporters to reduce methane leakage include:

- Enabling a cost-recovery mechanism for investments in pipeline modernization;
- Encouraging investment in accelerated pipeline replacement programs; and
- Tightening federal pipeline safety laws, which could also help reduce methane emissions from natural gas infrastructure.

And finally, there are the efforts by some State and local jurisdictions to reduce the consumption of natural gas through fuel switching policies, thereby reducing the leakage associated with the production and delivery of natural gas. But at what cost to the consumer? That will be the subject of the next article in the series.

## Amid Dire Colorado River Outlook, States Plan to Tap Their Lake Mead Savings Accounts

Excerpted from an article By Brett Walton, Circle of Blue by Jerry Gewe

Key Takeaways:

- Shared by seven states and Mexico, the Colorado Basin provides about 40 million Americans with a portion of their drinking water and irrigates up to 5.5 million acres.
- It is home to endangered species and supports about \$1.4 trillion in economic activity.
- Because of record-high temperatures and a drying climate, the basin is also dangerously close to being parched: Lake Mead, which is just 36 percent full, is in poor health. So is Lake Powell, located upstream and only 34 percent full.



Lake Mead, the largest reservoir on the Colorado River, is a centerpiece for water supplies in Arizona, California, and Nevada. Mead's declining water levels, projected to reach record lows in the next two years, will challenge water managers in the basin. Photo © J. Carl Ganter / Circle of Blue

A complex and arcane water banking program in the lower Colorado River basin, adopted in 2007 and later amended, was designed to incentivize water conservation, prevent waste, and boost storage in a waning Lake Mead.



The program has already proved its worth, lifting Lake Mead dozens of feet higher than it otherwise would have been and nurturing collaboration among states that will need to work together to surmount daunting challenges of water availability. In the next two years, the program will be tested in another way, becoming a small but important source of water for Arizona and California even as the lake continues to fall to levels that have not been witnessed in several generations.

Water managers in the basin view the program, called intentionally created surplus or ICS, as a flexible tool for adapting to a drying climate. It is a tool that they will soon call upon. The Metropolitan Water District of Southern California intends to draw between 100,000 and 150,000 acre-feet from its savings this year. Arizona officials, meanwhile, plan to use 69,100 acre-feet of ICS credits to reduce mandatory cutbacks that will be required in 2022 if Mead declines as projected.

Ever since the late-2000s, the last time that water supplies in Colorado River reservoirs reached critically low levels, the biggest water users in Arizona, California, and Nevada have been stashing water in Lake Mead, in preparation for another emergency to come — and in an attempt to avoid a catastrophic collapse of the region’s water storage system.

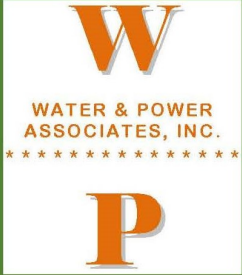
With the federal government now projecting that Lake Mead will drop precipitously in the next two years — perhaps to levels not seen since the Great Depression, when the country’s largest reservoir was first filled — that emergency has arrived.

Colorado River water users have invested billions of dollars to reduce consumption and increase resiliency, to prepare for the current situation.

## Save the Date

2021 CALENDAR

### GUEST OF THE MONTH



|   |   |
|---|---|
| REPRESENTATIVE FROM<br>PASADENA           | JULY 14, 2021<br>RENEWABLE ENERGY<br>MANDATE STRATEGIES         |
| REPRESENTATIVE FROM<br>BURBANK            | AUGUST 11, 2021<br>SMART GRID METERING<br>VALUE AND PITFALLS    |
| REPRESENTATIVE FROM<br>LADWP WATER SYSTEM | SEPTEMBER 8, 2021<br>SAN FERNANDO VALLEY<br>GROUNDWATER CLEANUP |
| REPRESENTATIVE FROM<br>LADWP POWER SYSTEM | OCTOBER 13, 2021<br>LONG TERM STRATEGIC<br>RESOURCE PLAN        |

# WATER BUZZ

## Biden Proposes Rest of Money to Fix Flood-risky Whittier Narrows Dam

Excerpted from DWR clipsheet of June 2

By Mike Sprague | msprague@scng.com | Whittier Daily News



Whittier Narrows Dam on Friday, Jan. 18, 2019. (Photo by Dean Musgrove, Los Angeles Daily News/SCNG)

PUBLISHED: June 1, 2021 at 4:46 p.m.

UPDATED: June 2, 2021 at 12:42 p.m.

President Joe Biden has included more than \$219 million in his budget proposal to make what the government has described as urgent repairs on the Whittier Narrows Dam, enough money to complete the project.

The appropriation still must be approved by the U.S. House of Representatives and Senate. Last year's budget included about \$192.5 million for the project. At that point, the total cost was expected to come in at about \$385 million. The new figures released in the budget appear to add some \$26 million to the bottom line.

The dam, which sits in a natural gap in the hills, was built to hold back catastrophic flooding on the San Gabriel and Rio Hondo rivers — which was not uncommon before a system of dams were built in the 1940s and 1950s.

Five years ago, the Army Corps of Engineers upgraded the dam's flood risk from high urgency to very high urgency. The 2016 re-inspection revealed a greater threat of erosion and breach which could cause massive downstream flooding to 1 million Southern California residents in the event of a severe storm event.

## DWR Releases First Assessments of Initial Groundwater Sustainability Plans

Excerpted from DWR Press Release –

Published: Jun 03, 2021

**SACRAMENTO, Calif.** -- The California Department of Water Resources (DWR) today released its first assessments of groundwater sustainability plans developed by local agencies to meet the requirements of the Sustainable Groundwater Management Act (SGMA).



File footage of dried earth in California during drought conditions.

DWR has completed its assessment and approved plans for the Santa Cruz Mid-County Basin in Santa Cruz County and 180/400 Foot Aquifer Subbasin in Monterey County. The groundwater sustainability agencies (GSAs) for these critically over-drafted basins will continue implementing their plans to achieve SGMA’s goal of groundwater sustainability within 20 years.

“Local management, including development of solutions for the long-term reliability of groundwater, is the cornerstone of the Sustainable Groundwater Management Act,” said DWR Director Karla Nemeth. “DWR’s evaluation and assessment of groundwater sustainability plans is an important step in the long process of bringing our critical groundwater basins into sustainability, helping to ensure Californians have a reliable water source during drought years and for generations to come.”

SGMA initiated a new era of local groundwater management. For the first time in California’s water history, local agencies and groundwater users are required to form GSAs and develop and implement plans to guide how they will achieve groundwater basin sustainability goals over the next 20 years. SGMA lays out a process designed for continuous improvement – gathering information to fill data gaps, updating plans, and promoting science-based adaptation. Plans will be updated as new information becomes available and as conditions change in groundwater basins. DWR will review annual reports and assess each plan every five years to determine if the GSAs are on track to meet their basin’s goal.

### Metropolitan Water District Confirms Adel Hagekhalil as New General Manager

Adel Hagekhalil, a national water and infrastructure leader, will take the helm of the nation’s largest drinking water provider – the Metropolitan Water District of Southern California (MWD) following a vote of the agency’s Board of Directors.

Mr. Hagekhalil is a highly respected leader on wastewater and water reuse who will help the agency continue its path of investing in sustainable water supplies. He previously served as Assistant Director of the City of Los Angeles Bureau of Sanitation and spearheaded the Development of the City’s “2040 One Water L.A. Plan.” He is uniquely qualified to lead MWD as it faces the challenges of providing a reliable water supply for Southern California during this period of climate change.

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| <p style="text-align: center;"><b>BECOMING A MEMBER</b></p> <ul style="list-style-type: none"> <li>• HELP PRESERVE LOS ANGELES REGIONAL HISTORY OF WATER AND ELECTRICITY</li> <li>• DISSEMINATE KNOWLEDGE OF THE RICH MULTI-CULTURAL HISTORY OF LOS ANGELES</li> <li>• BECOME INFORMED AND GAIN INSIGHT AND EXPERTISE ON WATER AND ELECTRICITY ISSUES</li> </ul> <p style="text-align: center;"><b>ANNUAL MEMBERSHIP \$30</b></p> <p style="text-align: center;">ONLINE AT <a href="http://WATERANDPOWER.ORG">WATERANDPOWER.ORG</a><br/>         BY MAIL FILL OUT THE CARD AND WRITE CHECK TO:<br/> <b>W&amp;P ASSOCIATES, INC.</b><br/>         SEND BOTH TO:<br/>         1467 CREST DRIVE<br/>         ALTADENA, CA 91001</p> | <p>NAME _____</p> <p>ADDRESS _____<br/>         _____</p> <p>PHONE _____</p> <p>EMAIL _____</p> <p>TITLE/POSITION/COMPANY _____</p> <p style="text-align: right;">RETIRED/COMPANY _____</p> <p><input type="checkbox"/> Check if you would like to receive a digital copy of the newsletter only, to save mailing costs.</p> <ul style="list-style-type: none"> <li>• The W&amp;P Associates, Inc. is an IRC 501(c) (4) organization. Donations are not tax deductible.</li> </ul> |
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## LADWP Joins HyDeal LA, Targets Green Hydrogen at \$1.50/kilogram by 2030

Note: This edited press release was initially issued by the Green Hydrogen Coalition

On May 17, 2021, the Green Hydrogen Coalition in conjunction with the Los Angeles Department of Water and Power and other key partners, announced the launch of HyDeal LA, an initiative to achieve at-scale green hydrogen procurement at \$1.50/kilogram in the Los Angeles Basin by 2030. HyDeal LA is a collaboration of developers, green hydrogen off-takers, integrators, equipment manufacturers, investors, and advisors coalescing to overcome the biggest barrier to the green hydrogen economy — its high cost — by launching a commercial green hydrogen cluster at scale.



Green hydrogen is an abundant, carbon-free, and safe energy carrier that can be produced from renewable electricity and water or organic waste. It can be used as a carbon-free fuel and can provide long-duration seasonal energy storage. When used as an alternative to fossil fuels, green hydrogen can enable deep decarbonization of hard-to-abate sectors, enable the repurposing of valuable existing infrastructure and an affordable, responsible energy transition. Benefits to the economy include stable pricing, energy diversity, and increased economic development by reducing our need to import fossil fuels. Green hydrogen can be used to power anything from a power plant, to a steel mill, to a hydrogen fuel cell vehicle.

Independent studies, including the recently completed Los Angeles 100% Renewable Energy Study, point to the need for renewably fueled combustion turbines—available for limited periods—to achieve reliable 100% renewable electricity.

“Green hydrogen is the key to reliably achieving 100% renewable energy,” states Martin Adams, General Manager and Chief Engineer at LADWP. “We are pleased to join the HyDeal LA effort, which includes an innovative and expanding vendor and development community, to support and help catalyze the supply chain needed to achieve large-scale, low-cost green hydrogen power supply for our local in-basin plants.”

Joining HyDeal LA marks another significant initiative around green hydrogen for LADWP, which is leading the conversion of the Intermountain Power Project in Delta, Utah to the world’s first gas turbine intentionally designed and built to operate on 100% carbon free green hydrogen by 2035.

In addition to LADWP, HyDeal LA leaders include 174 Power Global, Mitsubishi Power, and SoCalGas. Key implementation partners Clifford Chance, Corporate Value Associates (CVA), Cranmore Partners, Energeia, Marathon Capital, Sheppard Mullin, and Strategen. Phase 1 of HyDeal LA will architect the high value competitive supply chain necessary to achieve \$1.50/kg delivered green hydrogen in the LA Basin, and gain in-principle agreement on the necessary terms and conditions to achieve production, storage, transport and delivery of green hydrogen at scale – all of which will be required to establish the green hydrogen ecosystem and economy in Los Angeles.

# Mystery History - July 2021



A man looks out towards a fenced-in large body of water. This was LA's first large scale water reservoir and served the City for over 87 years. The reservoir was taken out of service a year after this photo was taken. See answers on page 26.

Name this well known historic reservoir:

What year was it built?

- a) Elysian Reservoir
- b) Silver Lake Reservoir
- c) Buena Vista Reservoir
- d) Mulholland Reservoir
- e) Echo Park Reservoir

- a) 1851
- b) 1869
- c) 1887
- d) 1905
- e) 1923

# GUEST SPEAKERS

Summaries by Robert Yoshimura

GUEST OF THE MONTH  
APRIL 2021

**Reiko Kerr, Senior Assistant General Manager  
Jason Rondou, Manager of the LA100 Program  
Los Angeles Department of Water & Power**

## Update on Issues Facing the Power System

*The April 2021 guest speakers were Reiko Kerr, and Jason Rondou. They provided a summary of LADWP's entry into the California Energy Imbalance Market and update on the status of the LA100 Study.*

### Energy Imbalance Market – Reiko Kerr

The LADWP Board of Commissioners approved an agreement with the California Independent System Operators (CAISO) in 2017 to enter the voluntary Energy Imbalance Market (EIM). A 2016 study by LADWP predicted a net benefit of \$12 million per year by entering the EIM. Since then, more than 300 staff have worked on software, training, and procedural updates to accommodate EIM energy transfers at a total cost of \$30 million (\$13 million below budget). On April 1, 2021, those efforts resulted in the DWP's official entry into EIM and the live transfer of energy to and from the CAISO as needed in five-minute increments. LADWP is now the largest and most complex utility in the EIM.



Since going live on April 1<sup>st</sup>, during the first 10 days in EIM, DWP has received power about 70% of the time and transferred power to CAISO 30% of the time. The average cost of purchased power during that time was \$6.63/mwh, and the average cost of power sold to CAISO was \$68/mwh. Most purchases occurred during the day and most sales occurred at night. Thus, the DWP's involvement in EIM has enabled an overall reduction in energy cost and has helped CAISO to avoid solar curtailments during high production/low demand periods at mid-day. In some cases, DWP has been paid to take surplus power during the day.

Participation in EIM does not require a long-term commitment of resources to the market. Demand and supply conditions are reevaluated every hour and the ability to purchase or sell power is determined thusly. Reiko Kerr believes that DWP's participation in the EIM will be especially helpful in transitioning to 100% renewable energy because of the additional flexibility it provides in balancing demand and supply internally.

## LA100 Study – Jason Rondou

The LA100 study was initiated in 2016 when LADWP was developing a 20-year plan to map out the key initiatives needed in that timeframe. Concurrently, the LA City Council directed LADWP to include a study of the pathway and costs for achieving a 100% renewable energy portfolio by 2045. The directive also requested a determination of the benefits to the environment and health, the impact on local jobs and the economy, and how communities can shape these changes to prioritize environmental justice.

The LA100 Report is divided into components that represent three perspectives: the customer, the Power System, and the community. Impacts of conversion to 100% renewable energy are explored from each perspective.

The study evaluated four scenarios as follows:

1. SB 100 – the state mandated scenario that requires achievement of 100% clean energy by 2045 and allows 10% natural gas generation offset by renewable energy credits, existing nuclear generation, and any needed upgrades to transmission systems.
2. Early and No Biofuels – adds accelerated achievement of 100% clean energy by 2035 with no natural gas generation or biofuels.
3. Transmission Focus – achieves 100% clean energy by 2045 with no natural gas or nuclear generation but allows the development of new transmission corridors.
4. Limited New Transmission - achieves 100% clean energy by 2045 with no new transmission and no natural gas or nuclear generation.

The assessment of each scenario revealed a need for significant increases in energy capacity (doubling or tripling in some scenarios) and the need for in-basin combustion generation in all scenarios. The assessment also revealed that electrification will significantly improve air quality in all scenarios based on NOx and Particulate Matter emissions. It also revealed that LADWP's local generation activities contribute an exceedingly small part of the total emissions today and even less so in the future under all four scenarios. The cost of implementing each scenario varies from \$52 billion to \$82 billion in additional cost with the bulk of the costs accruing after 2030. Understandably, the high end of this range is associated with the Early/No Biofuels scenario.

Common elements across all scenarios include the need for flexible loads, increased rooftop solar, increased renewable energy projects, storage, and distribution and transmission upgrades. Additionally, depending on the scenario, at least 2,600 MW and as much as 5,000 MW of new renewably fueled turbine generation will be required.

The impact of 100% clean energy on power rates is significant and highly variable depending on the rates of electrification and the scenario selected. In the worst case, if no electrification occurs, the greatest impact on rates results. On the other hand, the highest level of electrification yields the lowest increase in rates because of higher revenues resulting from higher sales of electricity. In any event, rates will increase, but will be balanced by reduced customer costs for natural gas, gasoline, and other fuels that will be eliminated by electrification. Actual rates will increase from less than 20 cents/kwh today to 25 to 35 cents/kwh with moderate loads, 20 to 30 cents/kwh with high loads, and greater than 35 cents/kwh with no electrification.

The next steps in the LA100 Study process are to roll out a new interactive website providing information about the study and to continue public outreach and focused briefings. LADWP will also begin development of its 2021 Strategic Long Term Resource Plan that will incorporate additional scenarios not considered in the LA100 study to determine if avenues to achieve the stated goals at less cost are available. Finally, current plans for system improvements that also accommodate the clean energy goals will continue.

**Delon Kwan, Assistant Director of Water Resources  
Los Angeles Department of Water & Power**

## **UPDATE ON THE 2020 URBAN WATER MANAGEMENT PLAN (UWMP) AND OTHER WATER ISSUES**



### UWMP

The preparation process for the 2020 UWMP is nearly complete and DWP is close to submittal of the plan to the Board for approval. A more thorough summary of the UWMP was presented to W&PA last December by Sabrina Tsui and Ben Wong of Delon Kwan's team, so this will be a summary and update of that presentation.

The preparation of an UWMP is required by state law for any water utility with more than 3,000 customers or which supplies 3,000 AF of water per year. Updates are required every five years. LADWP qualifies under

the law and must comply in order to remain eligible for state grants and loans. The law requires utilities to assess the reliability of water sources over a 20-year timeline, define demand management measures for that timeframe, and develop water shortage contingency plans and scenarios.

A key strategy for sustaining the reliability of Los Angeles' water supplies is the Local Water Supply Program which addresses conservation, recycled water programs, and stormwater capture. Conservation efforts will focus mostly on reducing outdoor water use because most indoor conservation strategies have already been implemented. Recycled water programs focus on Operation NEXT which will recycle all the wastewater from Hyperion Water Reclamation Plant for non-potable uses (to reduce demand) and groundwater recharge (to increase local supply). The volumetric impact on future water supply from NEXT will not be quantified until the next iteration of the UWMP is produced in 2025. Stormwater capture projects are expected to increase capacity from 75,000 AF/Y today to at least double that amount when the projects are complete.

The Reliability Assessments in the UWMP law prescribes a 20-year forecast of reliability in 5-year increments under three scenarios: 1) normal year, 2) single dry year, and 3) multiple dry years. Additionally, a drought risk assessment is required for 5 consecutive dry years matching the driest 5 consecutive years on record. The findings of the study conclude that LADWP will have long-term supply reliability through 2045 under all three scenarios, and near-term reliability for a 5 consecutive dry year period. In 2045 demand will be just over 700,000 AF but conservation efforts will reduce that demand to 580,000 AF which represents a 10% growth in demand over the next 25 years. Supply in 2045 will come from Los Angeles Aqueduct (184,200 AF), Groundwater (134,800 AF), Recycled Water (30,000 AF without considering Operation NEXT), and MWD (216,800 AF). This breakdown reveals a significant potential for reducing MWD water use when Operation NEXT comes online.



The Water Shortage Contingency Plan (WSCP) is a new requirement added by Senate Bill 606 in 2018 and functions as a stand-alone plan that is adopted separately from the UWMP and must be included as a part of UWMP. The WSCP must identify shortage vulnerabilities for 6 standard shortage levels and prescribe response actions to mitigate those shortages. For the City of Los Angeles, its existing water conservation ordinance covers the required aspects of the WSCP, thus minimizing the additional development needed to comply with this requirement.

The public comment period for the UWMP occurred between February and April of 2021 by way of public meetings held throughout Los Angeles and the Owens Valley. Common feedback themes included concerns about 1) the reliability and cost of MWD supplies, 2) the feasibility of demand and conservation projections, 3) the urgency of Operation NEXT to reduce our dependence on MWD, and 4) increasing Owens Valley water uses by reducing imports. The Board of Commissioners has been updated on the UWMP at the end of the comment period, and the final UWMP will be submitted to them on May 25, 2021 for final approval.

### OTHER ISSUES

Governor Newsome issued a drought proclamation on April 21 affecting only 2 counties. Yesterday, he expanded that proclamation to incorporate a total of 41 counties in Northern California and the Central Valley, but not including Southern California. The abundance of water storage facilities due to significant investments made by local water agencies over the years enables Southern California to sustain its water supplies during droughts more easily than Northern California.

Precipitation in the Sierra is less than 50% of normal in 2021. The resulting lower flows in the Sacramento River have forced the state to reduce its initial allocation to State Water Project (SWP) Contractors from 10% to 5%, tying 2014 for the lowest allocation in history. The Colorado River basin expects current year runoff to be 38% of average and the Bureau of Reclamation is predicting a Level 1 shortage (for the first time ever) by December 2021, which will trigger cuts in deliveries to Arizona and Nevada. Because of the low SWP allocation, total storage in the MWD system is projected to be reduced by 550,000 AF to 2.6 million AF at the end of 2021. Thanks to conservation efforts during the last drought, MWD storage was at its highest point ever at the end of 2020, thus enabling the region to sustain its water supplies through 2021 and endure a second or third year of drought.

The drastic reduction in SWP allocation to Southern California is problematic for MWD because two areas within the MWD service region can only be served from the SWP. MWD has thus implemented a "Shift" program where DWP would take less water from the SWP and more from the Colorado River. This results in substituting treated water from the Colorado River for raw water from SWP. Thus the "Shift" program will reimburse DWP for the treatment surcharge. DWP is the only MWD member agency with the operational flexibility to do this.

The city's water demand for April 2021 through March 2022 is projected to be 496,954 AF. That demand will be fulfilled from our current sources of supply as follows: 311,526 AF from MWD (62%), 93,034 AF from the Los Angeles Aqueduct (19%), 84,145 AF from groundwater (17%), and 11,549 AF from recycled water (2%). Because of the region's investments in conservation, local supply projects, and storage projects, the availability of supplies as projected above are reliable. DWP is concerned, however, that should subsequent years of drought continue, water stored in San Luis Reservoir by MWD which was made possible by the investments described above, could be reallocated to other users, thus penalizing Southern Californians for making those investments.

The MWD Board of Directors is facing several significant decisions in the upcoming year. A new General Manager is needed, and final interviews were conducted last week, but results have yet to be

announced. [See note of appointment of MWD new General Manager Adel Hagekhalil on page 19.] MWD's 2020 UWMP was due to be approved by the Board yesterday. They are also working on a new Integrated Resources Plan to define policies and programs to balance supply and demand. A working group of member agencies has been developing a fair method for recovering the cost of demand management. DWP would like it to be 100% volumetric rather than fixed fees based on other variables. Finally, the Shaw Law Group is investigating systemic problems related to MWD's EEO program and complaints from their employees.

DWP will be engaged in a number of upcoming discussions regarding MWD that could significantly affect its future operations and costs.

- The "Shift" program to assist MWD with operational flexibility is likely to continue, particularly because DWP receives funding from them for Local Resource Projects (LRP) and conservation.
- Some on the MWD Board would prefer to reduce such funding because LRPs and conservation ultimately result in decreased water purchases from MWD.
- Many on the MWD Board would also prefer to increase fixed charges to rely less on volumetric charges to offset future declines in sales. MWD currently receives 20% of their income from fixed charges and some would like to increase those charges to 30%. DWP is opposed to such a change because it would disincentivize investments in local projects and result in subsidizing other agencies.
- The MWD Board recently voted to continue funding for the planning phases of both the Regional Recycled Water Program and for the Delta Tunnel Project.
- Operating Guidelines for the Colorado River will expire in 2025. Consequently, the next round of discussions regarding new guidelines will begin soon and will now involve not only the seven Colorado Basin States, but Mexico and Native American Tribes as well.

Regarding MWD's recent decision to collaborate with Southern Nevada Water Authority to help fund MWD's recycled water program, LADWP has not considered joining that collaboration. Other funding sources would first be exhausted before a third party would be brought in, because DWP is forecasting a firm need for all the water to be produced from Operation NEXT.

Regarding future operations when SWP shortages occur, some thought is now being given to finding storage along the Aqueduct in the Antelope Valley that could be drawn upon when SWP water is not available to the Valley. Such storage would further increase operational flexibility although storage in an unadjudicated basin would be risky.



## MYSTERY HISTORY

*Answer to Mystery Questions:*

**Buena Vista Reservoir – Built in 1869**