



JANUARY 2022



WATER & POWER ASSOCIATES, INC.

NEWSLETTER

For a Sustainable Los Angeles

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Update on California's Drought

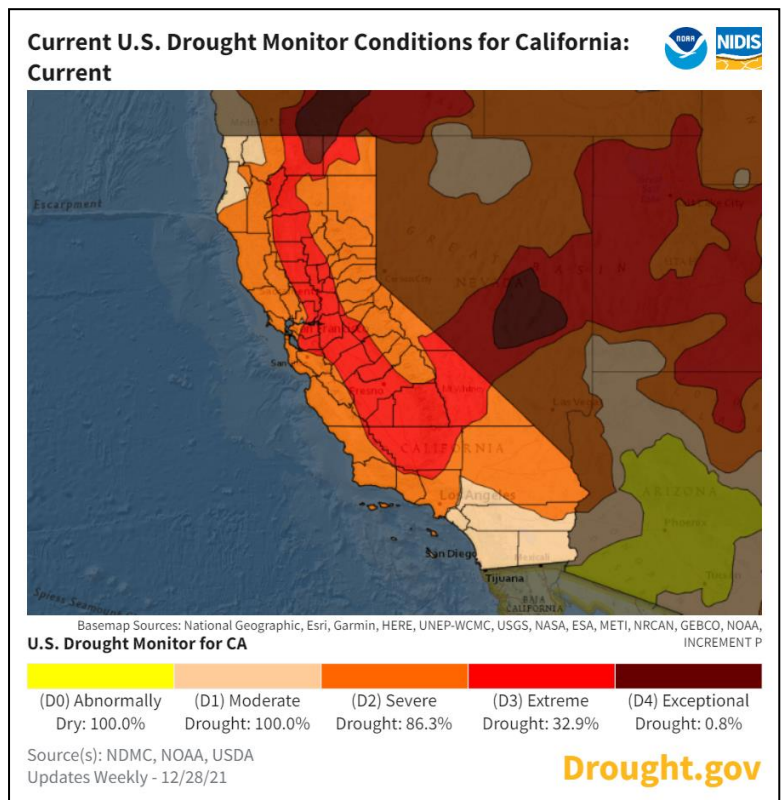
By Robert Yoshimura

In the July 2020 issue of this newsletter, I posted an article titled "Revisiting California's Drought – Where are We Today?" At the time, we were celebrating the end of the third (and worst-in-history) drought since 2000 and anticipating better conditions ahead. Climate scientists were divided as to whether the 2020 wet year was in fact the end of the most recent drought or if it was merely a one-year respite in a 20+ year mega-drought. That question was answered soon enough, as the following (2020-21) year saw the return of severe, extreme, and exceptional drought conditions in various parts of California, which have persevered so far into the current year.

The National Integrated Drought Information Service (NIDIS), providers of the graphics shown below, officially declared an end to the last drought in March 2019. However, by May 2020, it noted that mild drought conditions returned to California and subsequently, such conditions have increased in severity since then.

In the figures below from NIDIS for the end of December 2021, the five levels of drought are explained and mapped both to show how various parts of California are affected by the current drought and how the severity of drought has evolved over time in each of the four droughts since 2000. The increasing extent of extreme and exceptional drought conditions is apparent from the timeline in the second figure below and is indicative of an alarming trend that supports concerns that climate change will further exacerbate the frequency and severity of droughts (and water supply) in the near future.

The return of drought conditions is also apparent in the storage data for California's 161 water supply reservoirs. As of the end of November 2021, the average storage volume in those reservoirs was 35% of their capacity, and 60% of normal for this time of year, not considering the cold December storms that



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Editor's Column

I am sure that each one of us that has worked for and/or supports sound Water and Energy Policy for Los Angeles was greatly disturbed about the news reports that the former General Manager and other Executives of LADWP abused the Public Trust that was put in them by accepting bribes to act against that trust. This points out the importance of having managers that understand their civic responsibilities and have a deep loyalty to the City, that generally comes from spending a career in public service to the City and its constituents. Very few of the top managers that have been recruited from outside the Department have been successful in advancing the interests of Angelinos but have generally been engaged in developing personal political agendas. The City should seriously consider advancing existing employees, with their loyalty to Los Angeles, before bringing in outside top executives.



Following is the message that the Current General Manager distributed to the employees of LADWP responding to the situation.

Jerry Gewe, Editor

A MESSAGE FROM THE GENERAL MANAGER

Date: December 14, 2021

Dear Fellow Employees,

The news last week about the crimes committed against this department and our customers by former General Manager David H. Wright was incredibly disturbing. It is understandable for every one of us here at LADWP to feel personally and professionally betrayed and offended.

We are more than 11,000 hardworking, trustworthy individuals who dedicate ourselves to serving the people of Los Angeles. No one here deserves to be tainted by the acts of Wright and the other individuals who conspired to commit these crimes. This was a complete violation of the public's trust and an insult to every current and retired employee of this Department.

I especially feel for the employees in our Information Technology Division, whose professional capabilities were discounted and often maligned as a means of justifying what we now know was a rigged contract. In contrast, our new Chief Information and Technology Officer has told me numerous times just how talented and professional our IT staff and managers truly are.

The brazenness of what occurred underscores the need for more and better safeguards to prevent any employee or contractor from perpetrating these kinds of acts again. It is not only important to provide more avenues to report fraud and abuse, but also to create a culture in which employees feel safe to speak up and be heard and have confidence that their concerns will be addressed and not merely dismissed. I am eager to work with our Board on this and support their efforts to ensure that unethical and criminal acts are prevented from occurring again in the future. As we work to strengthen the culture within the Department, it is my goal to create an environment where communication, integrity, and transparency are expected of everyone, no matter how senior in level.

I am confident that the judicial system will deal with those who were involved in these bad acts. For us, we need to continue to be a good example of who we really are as we serve our customers and each other day in and day out. Be proud of the work you perform on behalf of this City as we move the Department forward together.

Martin L. Adams
Chief Engineer and General Manager
Los Angeles Department of Water and Power



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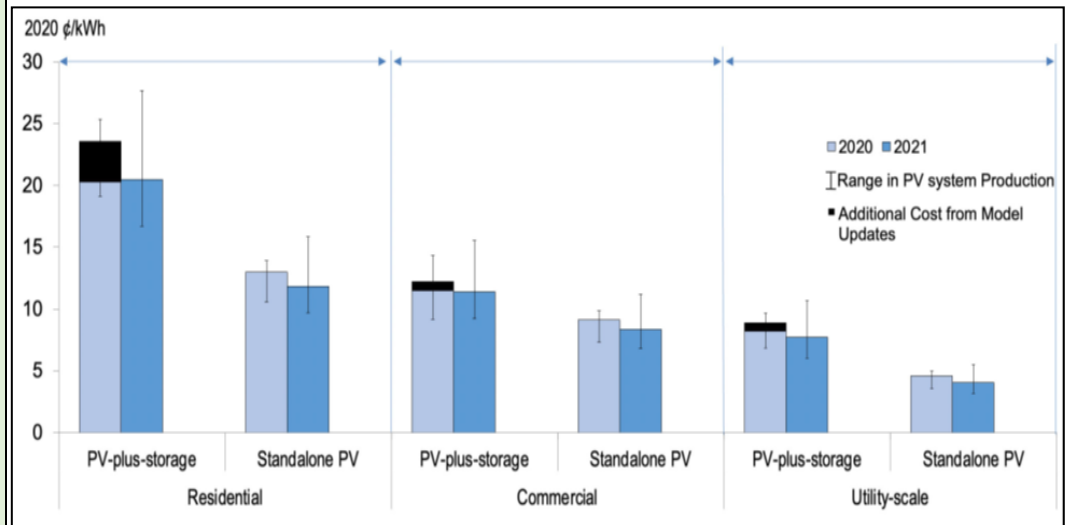
NREL Reports Continuing PV and PV-Plus-Storage Cost Declines

Excerpted from APPA, November 29, 2021 by William Glauz

A new report from the National Renewable Energy Laboratory (NREL) finds continued cost declines across residential, commercial, and industrial photovoltaic (PV)-plus-storage systems, with the greatest cost declines for utility-scale systems. Standalone storage systems also saw cost declines.

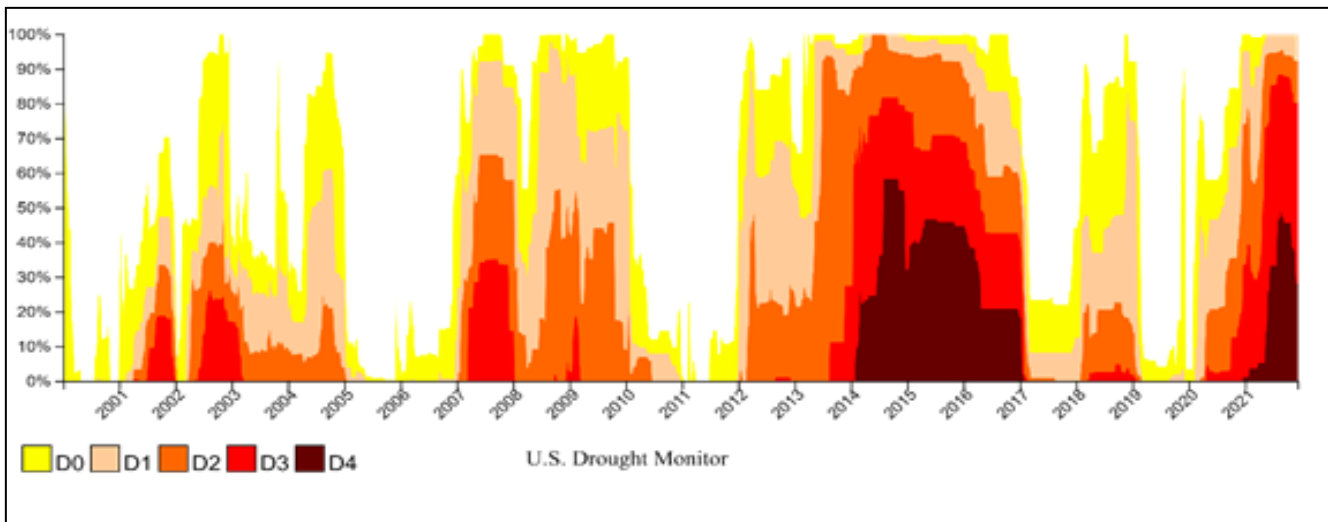
NREL's new report also finds that costs continued to fall for residential, commercial rooftop, and utility-scale PV systems -- by 3%, 11%, and 12%, respectively, compared to last year.

In a change from previous years' reports, balance of systems costs have increased or remained flat across sectors this year. However, this increase in balance of systems cost was offset by a 19% reduction in module cost, causing overall costs to continue their decade-long decline.



(Continued from Page 1)

dropped an average of 17 feet of snow in the Sierra but are not believed to have added much water to reservoir storage. Those storms did significantly improve the snowpack statewide. The statewide average snowpack is 55% of the April 1st average and 157% of the normal snowpack as of January 2, 2022, signaling optimism that the spring snowmelt will at least partially replenish the state's reservoirs. However, in anticipation of a third consecutive year of drought driven by La Nina conditions, the California Department of Water Resources (DWR) announced on December 1 that it would not plan water deliveries through its typical allocation process until it has a clearer picture of the reservoir and hydrologic conditions going into next spring. In other words, the initial allocation is zero, the lowest in the history of the State Water Project.



Conditions on the Colorado River system are similar, with total storage in the lower basin reservoirs averaging 37% of capacity as of December 27, 2021. Storage in Lake Mead has steadily declined from 1,215 feet in elevation in 1999, to 1,066 feet today (as of Dec 27, 2021) and contains 34% of its capacity. A Level 1 water shortage was declared in August 2021 when Lake Mead's water surface elevation dropped below 1,075 feet. As a result, both Arizona and Nevada will suffer curtailed water deliveries from Lake Mead in 2022. California will not be affected by curtailments until a Level 2 shortage occurs (when the water surface elevation of Lake Mead drops below 1,050 feet).

Because of the alarmingly rapid decline in Lake Mead's water surface elevation, representatives of the three lower basin states began negotiating reductions in use that are intended to increase Lake Mead storage by 500,000 acre-feet over the next two years. Such negotiations are required when a Level 3 shortage (1,025 feet elevation) is declared or when hydrologic modeling predicts that water levels will drop below 1,030 feet within two years. The lower basin users are responsibly anticipating a continuation of the drought and desire the time to manage water use in a controlled and thoughtful fashion. The negotiations focus on fallowing farmland and conservation by urban users to achieve the savings and a means of funding to pay for such programs. A final agreement on this plan (known as the 500+ Plan) was reached in December 2021. Details of that agreement can be found elsewhere in this newsletter in an article titled "Lower Basin States Sign Voluntary Agreement to Cut Water Deliveries from Colorado River".

IEA: Record Renewables Growth Predicted Despite High Commodity Prices

Excerpted from Power Magazine, 12-1-2021 by William Glauz

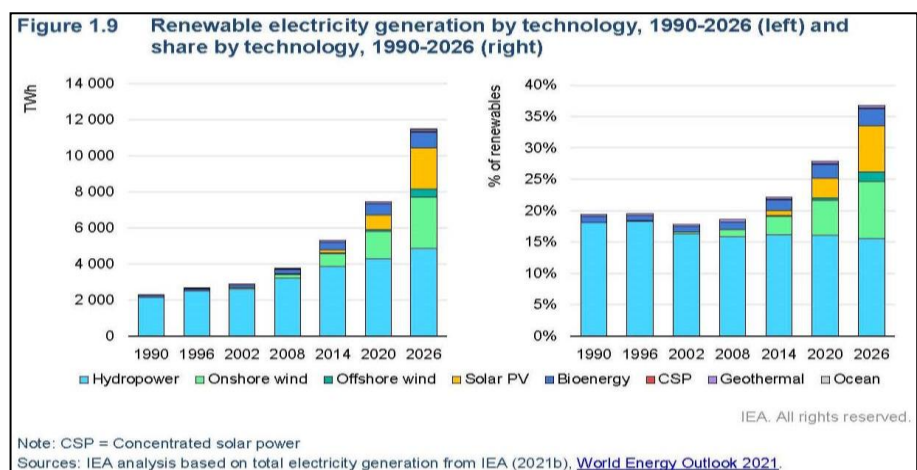
The world's capacity to generate electricity from renewable technologies is on course to accelerate, with 2021 expected to set a fresh all-time record for new installations, according to the latest report released by the International Energy Agency (IEA). IEA emphasizes that despite rising costs for key materials used to make solar panels and wind turbines, additions of new renewable power capacity this year are forecast to rise to 290GW in 2021.

The IEA's annual *Renewables Market Report* finds that by 2026, global renewable electricity capacity is forecast to rise more than 60% from 2020 levels to over 4,800GW – equivalent to the current total global power capacity of fossil fuels and nuclear combined.

Other key report findings include:

- Renewables are set to account for almost 95% of the increase in global power capacity through 2026, with solar PV alone providing more than half.
- China remains the global leader in the volume of capacity additions: it is expected to reach 1200GW of total wind and solar capacity in 2026.
- India is set to be the country with the highest rate of growth, doubling new installations compared with 2015-2020.
- Deployments in Europe and the United States are also on track to accelerate significantly from the previous five years.
- Solar PV remains the highest renewable resource in terms of growth, with its capacity additions forecast to increase by 17% in 2021 to a new record of almost 160 GW.
- Despite rising prices limiting growth, global biofuel demand in 2021 is forecast to surpass 2019 levels, rebounding from last year's huge decline caused by the pandemic.

The report recommends governments further accelerate the growth of renewables by addressing key barriers, such as permitting and grid integration challenges, social acceptance issues, inconsistent policy approaches, and insufficient remuneration.



Lower Basin States Sign Voluntary Agreement to Cut Water Deliveries from Colorado River

By Robert Yoshimura

On December 15, 2021, representatives of water agencies from the three Lower Basin states (Arizona, California, and Nevada) signed an historic agreement known as the 500+ Plan to reduce withdrawals of water from the Colorado River to forestall water shortages in the future. A 20+ year mega drought in the Colorado River basin combined with historic over allocation of water from the river have combined to reduce the volume of water stored in Lake Mead by two-thirds. Since 1999, the water surface elevation has dropped 150 feet and left a noticeable “bathtub ring” in the lake.



In 2019, following five years of negotiation, the Lower Basin Water agencies signed the Drought Contingency Plan (DCP) that established measures to equitably allocate cuts in water deliveries in years of water shortage and to voluntarily reduce water usage to prevent further declines in Lake Mead storage. Those efforts were unfortunately insufficient because the water surface elevation dropped below 1,075 feet in August 2021. According to the Law of the River, the 1,075 level triggers mandatory cuts in deliveries of water to Arizona and Nevada in 2022. Furthermore, hydrologic modeling by the US Bureau of Reclamation (USBR) predicted further reductions will occur over the next two years to a level of 1,030 feet. When such a prediction is made, a DCP provision requires the Lower Basin water agencies to consult with each other and develop measures to prevent reductions below 1,020 feet. Consequently, the Arizona Department of Water Resources, the Central Arizona Project (CAP), the Metropolitan Water District of Southern California (MWD), and the Southern Nevada Water Authority agreed to begin negotiating a plan to halt the declines in Lake Mead. To their credit, those agencies have rapidly and successfully achieved their goal, culminating in the 500+ Plan that will help to stabilize Lake Mead.

The 500+ Plan calls for reductions in water use by the four participant agencies plus USBR totaling 500,000 acre-feet per year for the next two years. Reductions in water use will be facilitated through conservation programs, irrigation improvements, fallowing of farmland, and compensated cutbacks by Indian Tribes along the river. Such programs will require funding to compensate farmers and Indian Tribes for fallowing, and to pay for the needed urban and agricultural conservation programs. The cost of those programs is estimated to be \$100 million per year. The agencies have agreed to the following financial investment in the program:

- Arizona Department of Water Resources - \$40 million
- Central Arizona Project - \$20 million

- Metropolitan Water District - \$20 million
- Southern Nevada Water Agency - \$20 million
- USBR - \$100 million (matching funds)

The \$200 million pledged by the participating agencies will fund the program for two years. Subsequently, additional funding will be negotiated to carry the program through 2026 when all existing agreements on the Colorado River will expire.

Ongoing negotiations over the next few weeks and months are planned to define the specific allocation of the water use reductions among the participants and the precise means of achieving them. Much of the reduction is expected to come from agriculture because 70% of Colorado River deliveries are used to grow crops. New urban conservation strategies will provide significant water savings as well.

In a separate action executed on the same day as the 500+ Plan, MWD and the Quechan Tribe of the Fort Yuma Indian Reservation have agreed to a seasonal fallowing program under which MWD will pay the tribe and its farmers to not grow crops during the spring and summer seasons. The Reservation is located on the Colorado River in southeast California. The tribe normally grows vegetables and other essential crops during the winter and non-essential crops during the spring/summer. MWD will pay \$473 per acre fallowed and up to \$1.6 million per year. 75% of the payments will go directly to the farmers and 25% to the tribe. This agreement alone is expected to save 3,500 acre-feet of water per year.

The 500+ Plan goes far beyond the scope of the Drought Contingency Plan, which was originally intended to stabilize Lake Mead. The participating agencies are hopeful that the additional efforts will be sufficient to sustain the water supply and hydroelectric generating functions of Lake Mead in the immediate future.

POWER BUZZ

Articles excerpted by Bill Woodson

Maine Voters Reject Power Project, Wall Street Journal, 11/04/2021

Maine residents voted to reject a \$950 million, 1200MW capacity power transmission line under construction there to import Canadian hydropower, raising a hurdle for a long-pursued method of adding clean energy in New England.

New Power Lines for Green Energy Pushed, Wall Street Journal, 12/31/2021

The Biden administration is trying to speed up the permitting process for high-voltage power lines as part of its drive to promote renewable energy. The \$1 trillion bipartisan infrastructure package enacted last month includes about \$5 billion for transmission support and gives the federal government more power to intervene in state-level disputes.

Suit Seeks to Block Nevada Geothermal Power Plants, L.A. Times, 01/01/2022

RENO – Conservationists and tribal leaders are suing the U.S. government to block construction of two 30 MW geothermal plants in northern Nevada’s high desert that they say will destroy sacred hot springs and could push a rare toad to the brink of distinction.

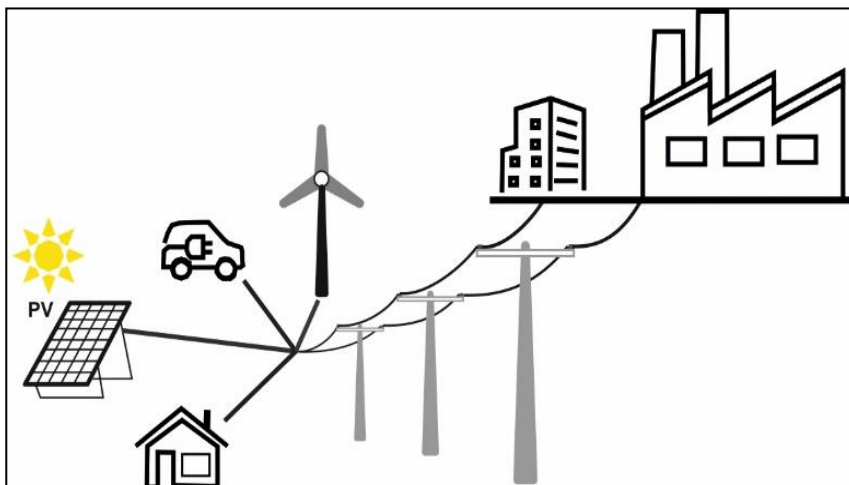
SLTRP Update

By William Barlak

SLTRP? What is that? Besides being a mouthful of an acronym, SLTRP is the LADWP Strategic Long Term Resource Plan that was formerly called the Integrated Resource Plan. The SLTRP is a comprehensive Power System plan that maps out supply side electricity initiatives and demand side programs in order to meet Los Angeles' clean energy goals set by City leaders while maintaining system reliability, reducing greenhouse gas emissions, and doing it all at the lowest cost to ratepayers. The study is scheduled to be completed September 2022 in order to comply with planning requirements set by the California Energy Commission.

LADWP is not starting from scratch in this project. Guiding the effort is work already done in the LA100 study, performed for LADWP by the National Renewable Energy Lab (NREL), and LADWP's own Clean Grid LA study. The SLTRP planning horizon is 2035 rather than the 2045 and 2030 horizons assumed in the NREL and Clean Grid studies, respectively.

Technically, SLTRP is a resource planning study that utilizes the standard industry simulation tools of capacity expansion, loss of load probability, and production cost modeling. Due to a tight deadline and resource constraints within LADWP, transmission and distribution analyses will not be included in this version of the SLTRP, but the study results will be reviewed by LADWP Transmission and Distribution planners. LADWP intends to include transmission and distribution analyses in future versions of the SLTRP.



The scope of the study includes:

- Developing a road map and budget to reach carbon-free goals set by City leaders that will support future rate actions;
- evaluating impacts to reliability, resiliency, environment, equity, affordability, and ratepayer bills;
- utilizing LA100 "Early and No Biofuels" scenario as a blueprint for 100% carbon free by 2035 with updated assumptions;
- considering sensitivities such as higher loads and higher resource prices than those assumed in the LA100 study.

The SLTRP study will be supplemented by future LADWP efforts such as Robust Distributed Energy Resources Modeling, Robust Environmental Justice Analysis, Jobs and Economic Impact Modeling, Power Flow Analysis which will feed into the Transmission Planning Ten Year Plan, Supply Chain Impact Analysis, Implementation/Feasibility Assessment, Strategic Long-Term Citywide Electric Vehicle Plan, and the Integrated Human Resources Plan.

The study has considered community input from an Advisory Group (AG) comprised of members from Los Angeles academia, business and workforce, City government, neighborhood councils, environmental interests, premier and key accounts, other utilities, and Water and Power Associates. The first AG meeting was convened on September 23, 2021, followed by six other meetings that occurred throughout October, November, and December. During the meetings, LADWP made presentations to the Group on energy storage, neighborhood equity and environmental justice, energy efficiency, electrification, electric vehicles, customer demand flexibility, distribution automation and voltage upgrade, distributed energy resources, and “no-combustion” results from the LA100 Study, just to name a few. Through these presentations, LADWP informed the AG on the complex issues involved in performing the SLTRP study so that the AG could reach consensus on the initial study assumptions that must be established before the actual technical study work is begun.

Early in the Advisory Group meeting process, Water and Power Associates stated its interest in ensuring that the SLTRP study would produce a power system at least as reliable as the present system, and that the resulting cost to the ratepayers would be presented not just as electric rates, but as expected customer bills that included both rates and Power Purchase Agreement “pass throughs.” Both of these interests will be included in the SLTRP study results.

As of this writing, the AG had agreed that LADWP shall consider the following four scenarios when performing the SLTRP technical simulations:

- SB 100, the reference case, assumes 60% renewables by 2030, and 100% clean energy by 2045;
- Case #1, a Moderate Interim case which assumes 80% renewables by 2030;
- Case #2, an Aggressive Interim case which assumes 90% renewables by 2030; and,
- Case #3, an Aggressive Interim case coupled with high Distributed Energy Resources which assumes 90% renewables by 2030.

The three Interim cases assume natural gas fired thermal generation will continue until 2035, after which thermal generation will be zero emission using hydrogen as fuel. These cases also assume varying degrees of local solar, energy storage, energy efficiency, demand response, building electrification, and transmission upgrades.



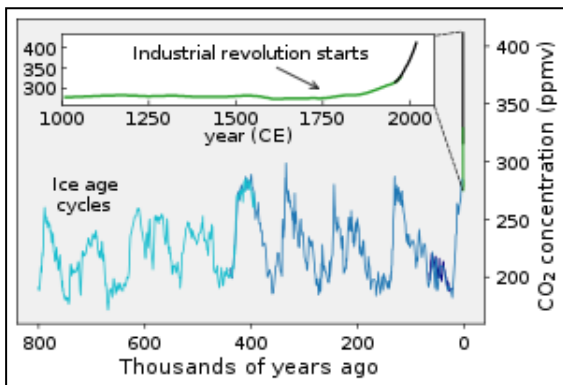
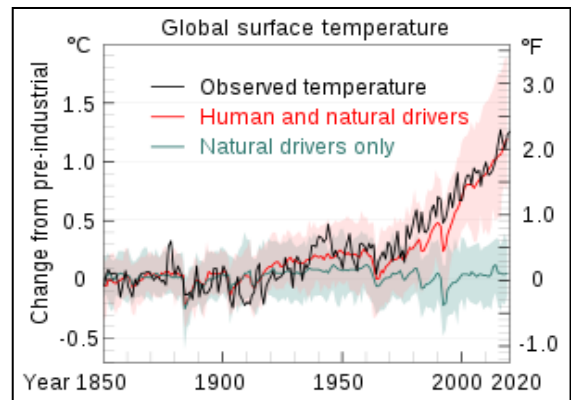
LADWP will complete the resource planning simulations for the cases and sensitivities listed above by sometime in the Spring 2022 at which time the Advisory Group will reconvene to be presented the preliminary study results. In late Spring 2022, LADWP will conduct a community outreach to share results followed by another AG meeting. Final simulations will be run in the Summer of 2022 followed by an internal LADWP review. The SLTRP Final Report will be published by the end of September 2022.

Is Hydrogen the Miracle Fuel to Address Global Warming?

By William Glauz

The next series of articles is intended to address the potential use of hydrogen as a fuel, replacing fossil fuels, to combat global warming. To begin, it is useful to provide some background on the topic of global warming to understand what is driving the interest in hydrogen.

The term climate change generally refers to the changes in earth's climate, primarily temperatures, but could also include changes in precipitation patterns. Climate change on earth happens due to both natural causes, including volcanic eruptions and solar activity, and human causes. The human-caused climate change is what is generally referred to as global warming. The earth's climate has been in a state of perpetual change since its beginning. However the most drastic changes have occurred in the past 150 years.



The main cause of this more recent pronounced change has been the drastic increase in the emission of heat-trapping greenhouse gases, mostly carbon dioxide (CO₂) and methane. Burning fossil fuels for energy use creates most of these emissions. Agriculture, steel making, cement production, and forest loss are additional causes. Temperature rise is also affected by things such as the loss of sunlight-reflecting snow cover, and the release of carbon dioxide from drought-stricken forests. Collectively, these amplify global warming.

The general effects of global warming include accelerated sea level rise increasing flooding in many regions, longer and more intense heat waves and drought, increase in storm intensity and rainfall rates associated with hurricanes and changes to precipitation patterns affecting crop growth and increasing property damage.

The above discussion is almost unanimously agreed upon by the scientific community. This has caused policy makers to implement policies that are hoped to reduce the pace and minimize the impacts of climate change. Most of these policies have targeted reduction in fossil fuel use in the energy sector, including supporting the development of renewable energy sources and electrification of transportation and industrial processes.

In the transportation sector, electrification seems to be happening, for the most part, based on market forces and technology development, with some level of government support. Another evolution in the transportation sector is the conversion of fuel from gasoline to hydrogen, primarily with the development of the fuel cell.

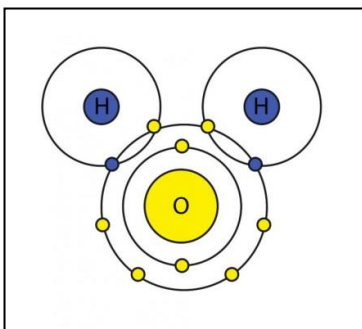
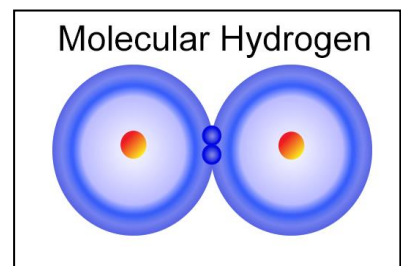
In the electricity industry, renewable energy resources (primarily solar and wind) are increasing dramatically. These new resources are primarily replacing coal, and to a lesser extent natural gas, as fuels for traditional combustion-based electricity production. A good example of this trend is the LA 100 plan that has been discussed extensively in recent Water and Power Associates newsletters.

One of the biggest concerns with replacing all fossil- fueled generation with renewables is being able to reliably supply the electricity demands of Los Angeles customers with a variable supply of renewable generation. This can be addressed through energy storage, such as pumped storage hydroelectric or batteries, but there are practical, technical and financial limits that can influence the use of these types of energy storage.

Another potential solution is to use hydrogen, as an alternative to hydrocarbon fossil fuels, through either conventional combustion type generation or fuel cells to produce electricity.

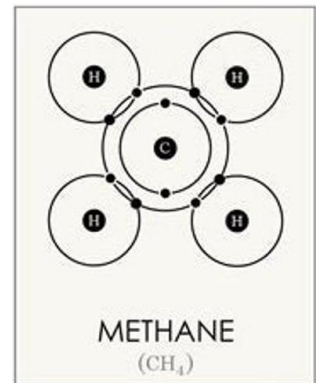
What is Hydrogen?

Going back to basic chemistry, hydrogen is the lightest chemical element with the symbol H and atomic number 1. At standard conditions the most common hydrogen molecule is a gas having the formula H₂, consisting of two hydrogen atoms, with each atom consisting of one proton, one electron and no neutrons. H₂ is colorless, odorless, non-toxic, and highly combustible. Hydrogen is the most abundant chemical substance in the universe, constituting roughly 75% of all normal matter. Stars such as the Sun are mainly composed of hydrogen in the plasma state.



Most of the hydrogen on Earth exists in molecular forms such as water and organic compounds, such as hydrocarbons (natural gas or methane, oil, coal, etc.), and is therefore referred to as an energy carrier. Hydrogen has the highest energy content of any common fuel by weight (about three times more than gasoline), but it has the lowest energy content by volume (about four times less than gasoline).

In the next article in this series we will discuss how hydrogen is produced and used today, how it could be produced and used in the future, and what are the technological, environmental, safety and cost implications of using hydrogen.



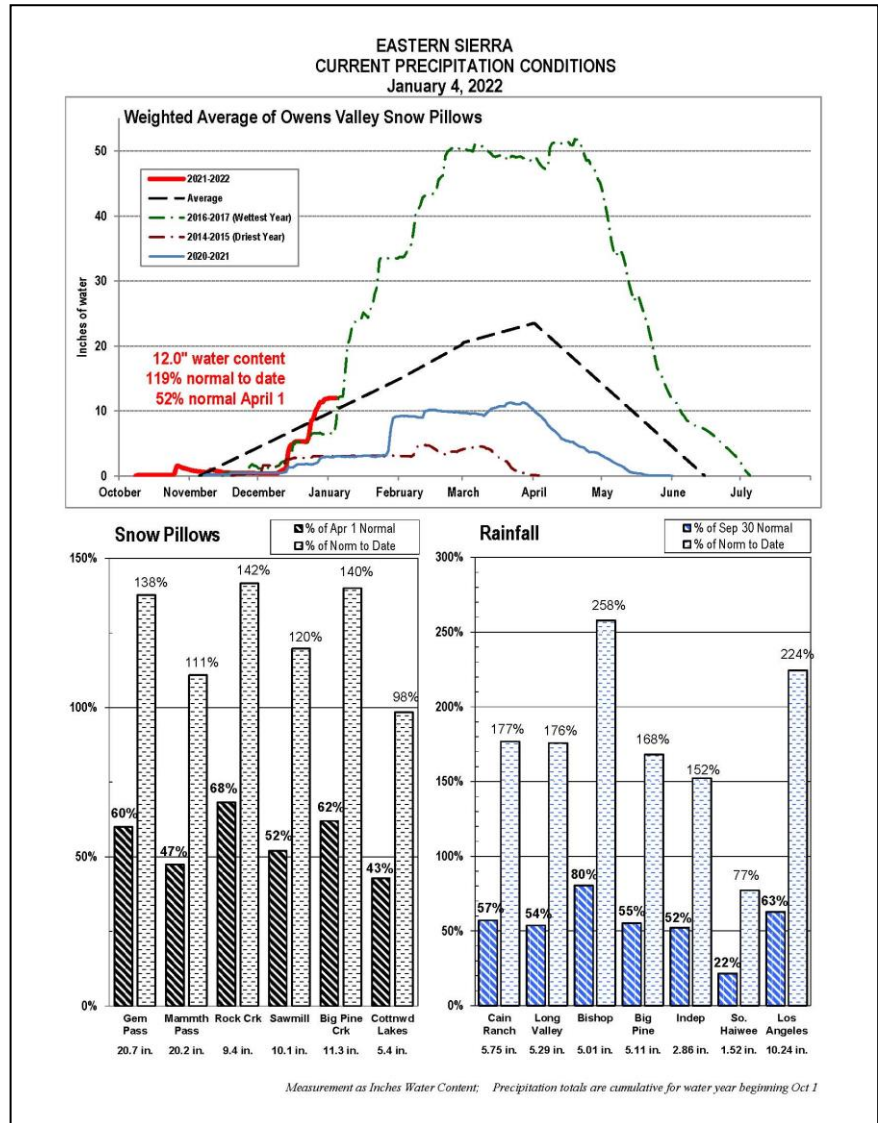
Eastern Sierra Snowpack

By Jerry Gewe

The primary source of water for Los Angeles during normal years comes from the eastern Sierra snowpack. However, during dry years such as last year, the larger quantity comes from purchases from the Metropolitan Water District of Southern California.

As you can see from this graphic the current water year started off very low with a small, above normal accumulation at the end of October, which largely melted by early December. However, during December the snowpack increased (122% of normal) for that time of year (which is actually higher than the wettest year on record of 2016-17). While this is a good start, it remains to be seen what the final water supply picture will look like at the end of the season in April, as the runoff in a year after several dry years (such as we have experienced) typically tends to be lower. In addition, our ability to predict precipitation in the future is not precise, thus we cannot say with certainty what the next few months will bring, even though with the current snowpack we can say it will be better than last year.

Keep up the good work in using water wisely.



Is California Ready for the Summers of 2022 and 2023?

Excerpted from POWERGRID by Bill Woodson

In August, 2020, the California Independent System Operator (CAISO) was forced to briefly shed load in the evening hours of August 14 and 15. Those events triggered a flurry of regulatory activity, as California's energy agencies and CAISO worked to ensure that when abundant solar generation rolls off the system in the evening hours, enough electric capacity was still available to meet load--especially during extreme weather and/or wildfire events.

CAISO managed to survive Summer, 2021 without any load-shedding events. July, 2021 provided the greatest challenge due to a West-wide heat wave and transmission outages related to the Bootleg Fire. However, August and September, 2021 were milder: In 2020, load peaked at 47,121 MW on August 18. In contrast, the 2021 load peaked at only 43,982 MW on September 8. For reference:

- California all-time peak demand was 50,270 MW on 7/24/2006
- LADWP all-time peak demand was 6,502 MW on 8/31/2017

However, a CAISO analysis showed that there is a potential shortfall of over 4000 MW if an extreme weather event occurs. And, California's increasing wildfire challenges also threaten its ability to import power, a critical component of meeting energy needs. In 2020 the net imported electricity for the state was 81,633 GWh, or 30% of electricity demand for the year.



The California governor's office, CAISO, state energy agencies---including the Public Utilities Commission (CPUC) and Energy Commission (CEC), have engaged in numerous efforts to provide for additional capacity to meet the challenges of Summers 2022 and 2023. Governor Newsom issued an Emergency Proclamation on July 30, 2021 to free up energy supply to meet demand during extreme heat events and wildfires, and to expedite the deployment of additional generation. The CEC then acted to issue orders to implement the Emergency Proclamation, including an order establishing a process for review of

changes to existing design, operations, or performance of existing facilities, an order to expedite licenses for new emergency or temporary power generators of 10 MW or more and an order for licensing new or expansions of existing battery storage systems of 20 MW or more.

The Department of Water Resources (DWR) and CEC also moved to site four 30 MW temporary gas turbines at two existing facilities, and CAISO petitioned FERC (and obtained) a tariff waiver to expedite the interconnection of two of the turbines at the Greenleaf 1 facility in Yuba City.

CPUC has also issued a number of decisions requiring the procurement of additional capacity. In November, 2020, CPUC initiated a new rulemaking (R.20-11-003) to address emergency reliability for Summer, 2021. In February, 2021 CPUC directed PG&E, SCE & SDG&E to seek contracts for additional generation capacity.

On March 18, 2021, CPUC approved utility contracts for 564 MW of additional capacity by Summer, 2021 which were subsequently procured. On March 25, 2021, CPUC required PG&E, SCE and SDG&E to take numerous actions intended to reduce demand under stressed conditions, and authorized the utilities to procure additional capacity.

In June, 2021, CPUC required the procurement of an additional 11,500 MW of “net qualifying capacity” (referring to the amount of capacity that counts toward reliability requirements, not nameplate capacity).

CPUC has recently issued a flurry of proposed decisions which:

- Conclude the electric capacity needs for 2022 and 2023 to be 2000 to 3000 MW.
- Implement a variety of demand response changes and supply-side measures designed to speed procurement of additional capacity and advance on-line dates.
- Authorize SDG&E to procure up to four new energy storage microgrid projects.
- Approve and fund several initiatives to reduce demand through various energy efficiency actions.

On September 17, 2021, the California Water Resources Control Board approved extending the once-through-cooling policy deadline for Redondo Beach Generating Station Units 4, 6, & 8 (834 MW) for two years. A CPUC draft resolution approves power purchase agreements between SCE and AES Redondo Beach LLC for Units 5 & 6 for from 4/1/2022 to 12/31/2022.

Despite these efforts, however, getting additional capacity on-line by Summer 2022 remains challenging. Interconnection timelines remain an issue. Similarly, getting additional gas-fired generation on line on time will be difficult. A recent SCE letter seeking approval for 535.7 MW of utility-owned energy storage to address summer reliability emphasizes the need.

Whether all these efforts will be sufficient to avoid load-shedding in 2022 and 2023 remains to be seen. It will depend on a number of factors, including the amount of additional capacity that is actually able to come on line, the severity of any extreme weather events, and the extent to which wildfires will further impact CA’s access to electric capacity.

2022																											
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25	26	27	28	29	30	23	24	25	26	27	28	29	27	28	29	30	25	26	27	28	29	30	31				

Mystery History Questions

Presented by Jack Feldman



William Mulholland (center) outlines to a group of Southern California officials the necessity and benefits of a high dam at the above location shown by arrow and line.

When was the above photo taken?

- A) 1920
- B) 1925
- C) 1930
- D) 1935
- E) 1940

Name the dam:

- A) St. Francis Dam
- B) Mulholland Dam
- C) Hoover Dam
- D) Parker Dam
- E) Havasu Dam

Answers on Page 18

How Are Electric Utilities Preparing for EV Adoption?

Excerpted from Utility Dive, November 30, 2021 by William Glauz

Electric vehicles (EVs) could finish 2021 as 5% of new car sales in the U.S., according to market observers, and are expected to make up a growing share in the years to come. Driven by city and state electrification goals, and now supported by federal infrastructure dollars, the years ahead will be a critical time for utilities working to drive beneficial electrification.

Experts say EV adoption is poised to surge in the United States, potentially fueled by federal purchase credits now being debated on Capitol Hill. The proposal included in the Build Back Better legislation would knock up to \$12,500 off the sticker price of a new electric car or truck, depending on where and how it is produced. Used EV buyers could get up to \$4,000 back.

President Joe Biden wants half of all new passenger vehicle sales in the United States to be EVs by 2030. That's achievable, transportation experts say, but will require development of new supply chains, along with public charging infrastructure to support an equitable transition.

Are cities ready for the transition? Not yet, say experts. But some are heading that way, while others will face difficulties.

Los Angeles has the most EVs on its roads and is widely considered a leader on EV infrastructure, though city leaders acknowledge there is much work to be done. EVs make up about 12% of new car sales in California. The city of Los Angeles has about 4 million people and has developed a plan calling for 80% of all light-duty passenger vehicle sales to be EVs by 2028.

"We thought we were kind of ahead of the curve when it comes to EV infrastructure," said Yamen Nanne, who has been the electric transportation program supervisor at Los Angeles Department of Water and Power (LADWP) for the past two and a half years.

In the past three years, LADWP has helped to increase the number of commercial charging stations in the city by over seven-fold, said Nanne. Los Angeles went from about 2,000 commercial charging stations to over 14,000 commercial charging stations, with about 2,700 of those publicly accessible. "We've really been happy about what we've been able to accomplish in the last three years," he said.

But in May, the California Energy Commission completed an assessment at the direction of state lawmakers to determine how the state is going to meet EV adoption targets. New non-electric vehicles will stop being available for sale starting in 2035, and as a lead up to that, California wants to get to 7.5 million EVs in the state by 2030.

To accommodate those electric vehicles, the state will need about 1.2 million public and shared chargers, the CEC assessment found. Nanne said Los Angeles has about 10% of the state's vehicles, meaning the city needs about 120,000 commercial chargers by 2030. "We have a long way to go over the next eight to nine years to get there," he said.

The biggest challenge, said Nanne, is going to be finding the additional funding to help pay for some of the cost of installing the necessary infrastructure. So far, the city has installed about 15% of chargers available in Los Angeles by utilizing state funds through various market-based programs like the Low Carbon Fuel Standard program, he said. Ultimately, though, LADWP expects the private sector to play a major role. "Because we just simply don't have enough properties to accommodate 120,000 charging stations," Nanne said.

A second challenge is scaling up LA's ability to interconnect the charging stations onto its distribution system, which Nanne said will require additional investment. Some of that could come from the federal infrastructure bill recently signed by President Biden.

Another key issue is the utility's workforce, which may need to be expanded in order to complete the necessary grid upgrades. So far, said Nanne, 90-95% of EV-related work has not required power system upgrades. But the system was built in the 60s and 70s, and soon the additional load will become a challenge.

"As we start moving into a lot higher volumes and getting that infrastructure more spread out throughout the city, there are certain areas on our grid ... that are going to have to be upgraded in order to accommodate that additional load," he said.

LADWP is also one of a handful of utilities still using a lower-powered distribution system, Nanne said. While many utilities today run 12 kV or 18 kV systems, the Los Angeles municipal utility runs a 4.8 kV system.



"So that kind of limits us, in being able to host large loads, especially when it comes to high powered charging stations, fast chargers that have a lot more draw onto the grid," he said. Los Angeles is building out a 34.5 kV system, but it is limited.

"We're going to have to find ways to extend those lines to reach where the EV charging stations are going to go," said Nanne. "So that requires design, buying equipment, and then our workforce installing those circuits either underground or overhead throughout the city of L.A."

If the task sounds daunting, Los Angeles has a key advantage in its municipally-owned utility. "We're dealing with one authority having jurisdiction," said Nanne.

"So when it comes to permitting ... we're essentially dealing with sister agencies, whether it's the Los Angeles Department of Buildings and Safety, or Public Works," said Nanne. "We have those relationships that help to make this process hopefully a lot shorter than it would be otherwise, when you have a private utility that has to deal with multiple authorities."

Water Rights Files Being Updated

Excerpted from LA Times on 1/2/22 by Jerry Gewe

The California Water Resources Control Board is in the process of digitizing their Water Rights Filing System with a \$33 million appropriation in the California Budget.

Currently the records consist of millions of pieces of paper, some of which are over 100 years old, contained in filing cabinets, which makes researching the information on who are the owners of water rights very time consuming to research and limiting the ability of the Board to deal with water shortages associated with climate change.

A UC Berkeley Team developed a prototype system scanning, digitizing, and assigning metadata to over 130,000 pages of water rights documents from the Mono Basin (a primarily LADWP watershed).

The goal is to create a special image of California's water use with an ultimate goal to set up a telemetry system where water meters are directly connected to the internet, allowing decision makers to make better decisions on the use of water in California.



Mystery History Answers

- B) 1925**
- C) Hoover Dam**

GUEST SPEAKERS

Summary by Robert Yoshimura

GUEST OF THE MONTH
OCTOBER 2021

Jason Rondou, Director of Resource Planning, Development and Programs for the Strategic Long Term Resources Plan (SLTRP)

Los Angeles Department of Water and Power

This month's guest speaker was Jason Rondou, who provided a progress report on the 2022 SLTRP

The LA 100 Study performed by the National Renewable Energy Laboratory (NREL) was completed in March 2021 and outlined three pathways to achieve 100% renewable energy by 2045. It also identified a fourth pathway to achieve 100% renewables by 2035. For each pathway, NREL identified the issues and investments required to achieve the goal. One of the most significant findings was that the electrification of buildings and transportation is the key to affordability of this endeavor, and that implementation by 2035 carries a significant additional cost and effort. Since completion of the study, the City Council and Mayor have expressed their preference for the pathway that results in implementation by 2035. Fortunately, all four pathways share many common investments for which development can begin before a specific pathway is chosen. The common investments include electrification, rooftop solar, renewable energy sources, storage, and transmission and distribution upgrades.

Now that the LA 100 Study is complete, LADWP has begun working on developing those common investments and preparing the 2022 SLTRP to be completed in September 2022. The SLTRP will include an integrated Human Resources Plan, implementation and constructability reviews, and assessments of procurement risk, operations and maintenance, and supply chain risk. Finally, an Equity Strategic Study has begun to determine how to eliminate historical inequities in service and achieve equitable outcomes in the transition to 100% renewable energy.



The next steps in this process will focus on five areas as follows:

1. Accelerate to 80% Renewable 97% GHG-Free Energy by 2030 by adding significant new renewable sources.
2. Accelerate Transmission by completing 10 critical transmission projects in the next 10 years to accommodate growing demand due to electrification while maintaining grid reliability.
3. Transform Local Generation – a Green Hydrogen RFI has been issued to find a consultant to outline a path for transformation of all in-basin plants to hydrogen. Separately, hydrogen fuel conversion will proceed at the Scattergood Steam Plant independently of the above consultant study.
4. Accelerate Energy Storage by building 1,000 MW of energy storage by 2030.

5. Accelerate Distributed Energy Resources Equitably by deploying 1,000 MW of local solar and 500 MW of demand response. Additionally, DWP will double energy efficiency, and accommodate 580,000 electric vehicles by 2030. DWP will assure that investments equitably reach disadvantaged communities such that programs such as net metering are available to them.


In the LA 100 Study's 2035 carbon-free scenario, significant development of new renewable generation capacity will be needed. Most of the out-of-basin capacity will come from the 8,000 MW conversion of IPP to hydrogen-fueled power. Challenges are far greater for in-basin generation because easy solutions to storage needs are not apparent. Nearly 2,300 MW of dispatchable hydrogen generation will be needed and nearly 4,500 MW of new solar plus storage will be required. In all of the LA 100 scenarios, energy generation capacity will double by 2045, partly because of the intermittent nature of renewables, but mostly because of growth in energy demand due to electrification of buildings and transportation.

Distribution system improvements were not covered in the LA 100 Study but are a critical part of implementation of renewable power. A full conversion to smart meters is needed to efficiently deploy renewable energy and efforts to automate distribution are underway. The expansion of capacity of receiving and distribution stations will require the construction of approximately 20 new stations by 2040. In the last 20 years, LADWP has added only two new stations and have faced public opposition to their construction from residents near the chosen sites. LADWP is thus facing a significant challenge in making these needed upgrades. Additionally, one third of existing feeder lines (approximately 500 distribution lines) are over capacity. Replacement rates will have to increase several fold.

The LA 100 Study defined four scenarios for achieving 100% renewable energy but did not recommend a specific path forward. LADWP will use the SLTRP as the vehicle for selecting the precise pathway to its goal while maintaining reliability and affordability in an equitable manner. The SLTRP planning process is supported by an advisory committee of stakeholders on which the W&PA is represented. Since 2017, the SLTRP is a regulatory requirement under SB 300 and must be updated and submitted to the California Energy Commission every five years. The core principles of the SLTRP require a balance of reliability and resiliency, affordability and rates impact, and environmental benefits and equity. The SLTRP effort evolved from the Integrated Resource Planning (IRP) process which has been ongoing since 2000 and represents a more robust and detailed plan than the earlier IRPs.

As described above, the 2022 SLTRP will address numerous challenges presented by the renewable energy initiative and will address concerns absent from previous plans. An Integrated Human Resource Plan will accompany the SLTRP to address staffing and hiring issues that resulted from the exodus of senior staff following the deregulation of the energy industry. It will also address procurement issues that are likely to arise when multiple utilities begin their accelerated efforts to convert to renewable energy. Assessments will also be made for supply chain risks, implementation and constructability, and operation and maintenance. In all, the SLTRP process will be a monumental effort that will guide the successful achievement of LA's carbon-free energy goal.

SAVE THE DATE

2022 CALENDAR	<h2>GUEST OF THE MONTH</h2>	MARTY ADAMS GENERAL MANAGER LADWP	FEBRUARY 5, 2022 ANNUAL MEETING AT JFB Current Issues Facing LADWP
	MEETINGS VIA ZOOM EXCEPT AS NOTED	RANDY HOWARD GENERAL MANAGER NORTHERN CALIFORNIA POWER AUTHORITY	MARCH 9, 2022 Northern California's Strategy for Responding to Green Power Initiatives
		FRED PICKEL (INVITED) RATEPAYER ADVOCATE	APRIL 13, 2022

<h3 style="text-align: center;">BECOMING A MEMBER</h3> <ul style="list-style-type: none"> HELP PRESERVE LOS ANGELES REGIONAL HISTORY OF WATER AND ELECTRICITY DISSEMINATE KNOWLEDGE OF THE RICH MULTI-CULTURAL HISTORY OF LOS ANGELES BECOME INFORMED AND GAIN INSIGHT AND EXPERTISE ON WATER AND ELECTRICITY ISSUES <h3 style="text-align: center;">ANNUAL MEMBERSHIP \$30</h3> <p style="text-align: center;">ONLINE AT WATERANDPOWER.ORG BY MAIL FILL OUT THE CARD AND WRITE CHECK TO: W&P ASSOCIATES, INC. SEND BOTH TO: 1467 CREST DRIVE ALTADENA, CA 91001</p>	<p>NAME _____</p> <p>ADDRESS _____</p> <p>PHONE _____</p> <p>EMAIL _____</p> <p>TITLE/POSITION/COMPANY _____ 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> <p>• The W&P Associates, Inc. is an IRC 501(c) (4) organization. Donations are not tax deductible.</p>
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