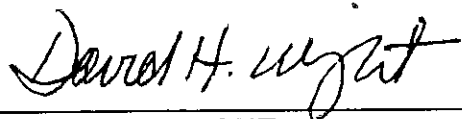


**BOARD LETTER APPROVAL**



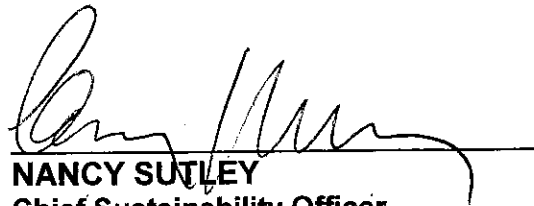
**DAVID H. WRIGHT**  
General Manager



**MARTIN L. ADAMS**  
Chief Operating Officer



**REIKO A. KERR**  
Senior Assistant General Manager – Power System  
Engineering, Planning, and Technical Services



**NANCY SUTLEY**  
Chief Sustainability Officer

**DATE:** June 22, 2018

**SUBJECT:** Proposed Accelerated Reduction of Greenhouse Gas Emissions through Reduction in Fossil Fuel Generation, Increase in Renewable Resource Targets and Energy Storage, and Additional Energy Efficiency and Solar Programs focused towards Customer Equity

**SUMMARY**

LADWP proposes to accelerate the de-carbonization of its power supply by increasing its Renewable Portfolio Standard (RPS) targets by 5% starting in 2025. This increases the 2025 RPS target to 55% (from 50%) and the 2036 RPS target to 70% (from 65%), which will be included in the 2018 Power Strategic Long-Term Resource Plan (SLTRP) – formerly referred to as the Integrated Resource Plan. This effort is proposed by supporting the reduction in the repowering of the 35 member Intermountain Power Project in Delta, Utah by an additional 30% and increasing the renewable resources imported through the IPP “Renewables Hub” in Delta to approximately 1,100 MW in 2036. LADWP will immediately match its share of natural gas resources with the same or higher levels of renewable resources when the smaller sized power plant is repowered in 2025. Staff is in the process of reviewing over 5,000 MW of Interconnection Requests at the IPP Renewables Hub to meet the initial target of approximately 550 MW new renewable resources in 2025.

Increased energy efficiency programs and shared solar opportunities will also be offered, targeted initially for lower-income customers that are renters in multi-family housing. This is a hard to reach customer segment because unlike homeowners, they do not usually have the ability to improve the energy efficiency of the buildings in which

they reside. An increased amount of \$100 million over five years will be budgeted to provide additional rebates for appliances and lightbulbs, but most of the funding will specifically target improved insulation in multi-family housing constructed before 1978, when improved insulation requirements were implemented in California. By targeting older housing stock, reduced power demand provides the most benefit in reducing GHG emissions, and helps reduce power bills for those customers who need help the most. An increase of \$10 million will be budgeted for shared solar programs in Clean Up Green Up communities such as Pacoima, Boyle Heights, Wilmington and Watts, starting in late 2018, and a pilot virtual net metering program is planned for 2019.

Additional energy storage is proposed at the IPP site where staff is evaluating proposals for a pilot Compressed Air Energy Storage (CAES) facility of approximately 150-200 MW. Should the new CAES technology effort not result in a feasible project, staff will include at least 160 MW of energy storage at the site to help balance and shape renewable resources that are imported from Utah and the surrounding states.

The proposed Resolution requests authorization for LADWP, as an Intermountain Power Project (IPP) participant, to exercise its contractual voting rights to provide for a reduction of capacity (Alternative Repowering) of the IPP generation units from the current contractually obligated repowering plan of 1,200 megawatt (MW) to 840 MW (of which LADWP's share from the Renewal Power Sales Contract will be reduced from 777 MW to 544 MW). All 35 participants in IPP must vote to reduce the size of the repowering and that vote is scheduled for the August 7, 2018 meeting of the IPP governing board. At this time, indications are that all members of the project support the reduced repowering. This Resolution is required in order to allow the engineering to proceed on this revised generation configuration to meet the contractually required start of permitting, construction, and installation of the project on January 1, 2020 and the in-service date of 2025.

These proposed units are smaller, lower emitting, more responsive, and more efficient than the previously approved units and would better support the transition to renewable technologies as part of LADWP's RPS mandates. In addition, the smaller units would open up additional transmission capacity for renewable integration, while supporting reliable operation of the Southern Transmission System (STS). These units are not proposed to provide baseload power, but are to be used to firm and shape renewable resources, and to provide necessary power at times such as late afternoon, when power usage significantly ramps up as renewable resources decline. LADWP proposes to fund the generation in an expedited timeframe so the generating units can be retired early without impact to the generation components of rates. Also, staff is reviewing the future ability to cost-effectively convert the units to a non-Greenhouse Gas (GHG) emitting power supply, such as hydrogen, so that the units can adapt to newer technologies.

Importantly, the IPP STS is a high-voltage direct current (HVDC) transmission line which begins at the IPP Renewables Hub and connects the LADWP grid to potential renewable resources outside California including Utah, Wyoming and other western states. Without participating in the repowering of IPP in 2025, LADWP would lose all

STS transmission rights and have to pay for much more expensive transmission to import necessary renewable resources. The STS transmission line is an integral component of achieving LADWP's increased RPS goals. Additionally, with increased amounts of energy being imported on the STS, it is estimated that gas usage in the LA-basin will be reduced - a necessary step towards environmental justice goals.

Los Angeles City Council approval is not required.

## **RECOMMENDATION**

It is requested that the Board of Water and Power Commissioners:

1. Support that the increased RPS goals of 55% by 2025, 60% by 2030, and 70% by 2036 will be included as a new resource scenario to be evaluated in the 2018 Power SLTRP list of proposed scenarios, presented for public outreach and comments, and given serious consideration by management, considering public feedback, as a 2018 SLTRP recommended case;
2. Adopt the attached Resolution authorizing LADWP to participate in a future vote on the Alternative Repowering;
3. Support budgeting beginning fiscal year 2019/20, of an additional \$100 million over five years in Energy Efficiency programs primarily focused on low income customers in multi-family housing;
4. Support budgeting beginning fiscal year 2019/20, of an additional \$10 million towards the Shared Solar Program, which will be starting in fiscal year 2018/19.
5. Support budgeting beginning fiscal year 2019/20 for a pilot Virtual Net Metering program starting in 2019; and,
6. Request that staff report back to the Board within 90 days on the status of the proposed Compressed Air Energy Storage project at the IPP site.

## **BACKGROUND**

LADWP proposes to accelerate the de-carbonization of its resource mix by making earlier reductions of fossil fuels and front loading more renewable resources into its power mix. This effort allows LADWP to continue to pursue its strategy of moving towards a clean and sustainable energy future. This proposed action results in an increase of 5% in its RPS starting in 2025 and in 2036 results in 70% of LADWP's power coming from renewable resources. This significant reduction in carbon emissions will be performed while increasing customer equity and focusing on local priorities. These increased renewable targets will be included in the 2018 SLTRP that will be presented through the public outreach process for consideration as the recommended case.

Repowering IPP in Delta, Utah at a lower 840 MW level than the current contractual commitment of 1,200 MW will allow additional renewable resources to be obtained and will raise the Department's renewable resource commitment from 50% to 55% by 2025, from 55% to 60% by 2030, and from 65% to 70% in 2036. LADWP will increase its renewables by approximately 550 MW by 2025 from the IPP Renewables Hub along the STS. This would effectively balance the power imported from the IPP site between

fossil fuel and renewable resources starting in 2025. Negotiations are ongoing with renewable resource developers surrounding the IPP Renewables Hub and will commence in earnest once the final size of IPP is determined. Over 530 additional MW of renewables will be added between 2025 and 2030 utilizing the IPP Renewables Hub and the STS. Finally, between 2030 and 2036, more than 400 MW of additional renewables will be added to the STS and other transmission lines to provide geographic diversity, but this also takes into account the lower STS rate impacts. As always, staff will continue to review the economics as they investigate all renewable resource opportunities. By 2036, it is anticipated that approximately 1,100 MW of renewable resources will be imported to Los Angeles from the IPP Renewables Hub and along the STS line. These increased commitments will be included and monitored in the Department's annual Power SLTRP.

IPP, which is owned by Intermountain Power Agency (IPA), a political subdivision of the State of Utah, consists of an 1,800 MW net coal-fired power plant located near Delta, Utah. LADWP and five other California publicly owned utilities (Anaheim, Burbank, Glendale, Pasadena, and Riverside), along with 23 Utah municipalities, and six Rural Electric cooperatives purchase power from IPP under the current power sales contracts.

LADWP, as IPP's Operating Agent, led the strategic planning efforts in negotiating the Renewal Contracts that allowed for the repowering of IPP from its current 1,800 MW of coal-fired generation to 1,200 MW of California-compliant Natural Gas Combined Cycle (NGCC) generation. The IPP Repowering Project is authorized pursuant to the provisions of the Second Amendatory Power Sales Contract, which was approved by the Board and the Los Angeles City Council, on June 2, 2015 and August 18, 2015, respectively. The governing bodies of all other participants also had to approve the contract as a unanimous supportive vote was required. Per the same approval process, LADWP was also authorized to enter into the Renewal Power Sales Contract when later offered by IPA. The Board also reserved oversight to first approve LADWP's exercising its contractual voting rights of an Alternative Repowering, which was defined as a reduction in the size of the NGCC plant.

On March 16, 2016, the Second Amendatory Power Sales Contract went into effect, allowing for the repowering of IPP's coal-fired generating units with NGCC units by July 1, 2025 ("the Project"). Subsequently, on January 16, 2017, the Renewal Power Sales Contracts were entered into by LADWP, and all IPP participants, with IPA. The Project will not only accelerate LADWP's complete coal divestiture two years earlier than originally dictated by contract, but it will also eliminate all coal-fired emissions from LADWP.

LADWP has been engaged in discussions with the IPP Participants since August 2017 to consider a further reduction in the size of the NGCC plant. LADWP believed that the Project Participants' needs from IPP might be better met by increasing available capacity on the transmission systems associated with IPP, namely, the STS and the Northern Transmission System (NTS), resulting from the reduction of the plant's generating capacity. This increased transmission capacity would allow for additional renewable energy generation projects to meet current and future RPS mandates. The

Second Amendatory Power Sales Contract allows for changes in the generation configuration pursuant to its Alternative Repowering provisions, but again requires an approval of all IPP Participants. Since LADWP had no leverage to require a reduction in the size of the project, these discussions were kept confidential until a formal proposal could be brought forward for consideration by the LADWP Board and the other 34 participants. IPA's Board has actively participated in the discussions over the last year, and now supports a reduction in the size of the plant and an increase in utilization of the site as an IPP Renewables Hub. The IPA Board required that an engineering study be performed by a team of international engineering firms to determine a reduced size of the NGCC plant that would meet the reliability requirements of the STS and the needs of all members. The proposed 840 MW reduced repowering was developed utilizing the results of that study.

The approval specifically sought by this resolution would allow LADWP, as an IPP Participant, to participate in a vote on an Alternative Repowering pursuant to the Renewal Contracts which would reduce the natural gas generation output from 1,200 MW to 840 MW. The new units are smaller, lower emitting, more efficient, and provide faster ramping output which will compensate for the variable output of wind and solar projects. Additionally, the smaller units will allow for the reliable operation of IPP's HVDC STS. The decrease in capacity from the original 1,800 MW coal units to the 840 MW Alternative Repowering allows an additional 960 MW of renewable energy which is equivalent to: 1) enough energy to power approximately 420,000 homes; 2) to meet the annual energy needs of both Burbank and Glendale; or 3) alternatively, a reduction of GHG equivalent to removing 2 million cars from the road. The reduced size of IPP will not result in any negative impacts on the assumptions to the Once Through Cooling or 100% Renewable Resource studies currently underway.

As stated, the reduction in the repowering of IPP from the currently contracted commitment of 1,200 MW to 840 MW will require approval of the IPA Board, and the IPP Participants. This reduction must be supported by the members' governing bodies. The vote for reduction in the repowering is scheduled at the IPA governing body's meeting on August 7, 2018. Other California and some Utah participants have stated that they will not bring the request to support the reduced repowering to their individual governing bodies until the action has been approved by the Board of Commissioners of LADWP.

Dual identical 420 MW units compose the 840 MW capacity. The units are not installed as ongoing LADWP baseload units, but will provide a steadily declining supply of power over the years, but at times when it is most needed. Two generating units are constructed so that when one unit is down for repair or maintenance, the other unit can still provide necessary resources to firm, shape, and supplement LADWP's load as needed. Identical units also help keep maintenance costs low as only one set of replacement parts are needed to maintain the two generators. Furthermore, as part of the technical analysis, staff is analyzing the replacement units to ensure that they can eventually utilize new technology. Some newer units will allow conversion to a cleaner hydrogen fuel source mix with possibly just a change-out of the nozzles. Staff is monitoring several smaller generating units around the world that are partially powered by hydrogen, however, this technology is still in the R&D stage and not determined

feasible for IPP at this time. As staff releases a Request for Proposal for a natural gas supply, LADWP will ensure that best technology for the gas transmission system is proposed to reduce and detect the risk of leaks along the gas transmission line.

In addition to increasing renewable resource targets and reducing fossil fuel generation, LADWP proposes to commit an additional \$100 million over the following five years to pay for energy efficiency and conservation programs primarily targeted towards low income customers renting in multi-unit housing complexes. Creating programs that benefit this segment of the customer base is difficult as these ratepayers do not have control over the energy efficiency of the buildings in which they reside. Landlords are usually less likely to participate in efficiency and conservation programs that only benefit in reducing utility bills of their tenants. The proposed funds will be utilized for basic programs such as insulation, appliance rebates and light bulbs. Staff is researching the savings to both the customer and the power utility of expanded insulation rebates for buildings constructed before 1978, when insulation requirements in California were minimal, to determine if insulation can be provided to these customers with little or no cost to the ratepayer or landlord. By focusing on older multi-family structures that are primarily used for rental units, LADWP can provide conservation programs for a customer segment that has been difficult to reach. Insulation not only reduces GHG emissions with lower electric usage, but also reduces GHG emissions through lower usage of natural gas heating. These program goals could also provide job training opportunities to more local individuals through the Utility Pre-Craft Training program by training more program participants to install insulation.

LADWP also proposes to increase the budgeted amount by \$10 million towards our Shared Solar Program where low-income renters and those in multi-family housing can participate in the benefits of solar investment, without requiring solar panels on their rooftops. Single family homeowners have had the opportunity to participate in the Solar Rebate Incentive Program for several decades, but this option has not been available to renters nor many of those who live in multi-family housing. The initial pilot phase of the Shared Solar Program is scheduled to launch in late 2018 after some required billing system programming is completed. Initially targeted would be this customer base in LA's Clean Up Green Up communities of Pacoima, Boyle Heights and Wilmington and Watts. Shared solar projects will be comprised of local installations in these communities and remote larger solar installations along the STS and other transmission corridors to allow shared solar rates to remain affordable. An additional benefit of focusing on local communities where our solar penetration is low is that it provides distributed generation resources more evenly throughout the circuits of the LADWP local grid.

A variation of shared solar is Virtual Net Metering where the customer also can participate in a remote solar facility but receive "virtual" benefits similar to customers who are able to install solar on their rooftops. This program allows a customer to create a solar kWh "bank" where hours can be saved and used over a longer period of time. Billing system programming for this effort is more complex, and LADWP will implement a pilot virtual net metering program in 2019.

The Delta, Utah location of IPP is one of the few sites in the United States that is potentially ideal for Compressed Air Energy Storage (CAES). This technology takes excess energy produced during peak resource supply periods, and utilizes the excess power to compress air into salt caverns that exist beneath the IPP site. This compressed air can then be utilized to supply power at times of peak demand. Much like a giant underground scuba tank, the CAES vessel is filled and emptied of air much like a rechargeable battery is repeatedly charged and drained. LADWP, along with several partnering utilities, are investigating an initial project at the IPP site and are currently in discussions with several vendors who propose to construct a pilot CAES facility. This technology has been used since 1991 in a 226 MW facility in McIntosh Alabama and since 1978 in a 290 MW facility in Huntorf, Germany. Potentially utilizing newer technology at the larger capacity will allow testing to determine if CAES can be utilized. Initial research indicates that there is the potential of between 1,500 and 2,000 MW at the Delta site. Staff will report back within 90 days as to the status of the potential project. Should CAES not appear to be a feasible, cost effective, alternative technology, approximately 160 MW of battery storage is contemplated for the IPP site, which would still allow for storing excess renewable energy for times when it is needed to meet demand.

### **FINANCIAL INFORMATION**

The original durations of the Second Amendatory Power Sales Contract and the Renewal Power Sales Contract (Renewal Contracts) remain unchanged. The Renewal Contracts allow each of the other five California IPP participants to altogether exit the project or reduce their generation entitlement shares by up to 20 percent up until November 1, 2019. If one or more of the California IPP participants should exercise such exit or reduction right, it is anticipated that LADWP will take the IPP generation entitlement shares and corresponding transmission shares.

The permitting and construction of the natural gas units under this Alternative Repowering would begin no later than January 1, 2020, and be completed and commercially operational no later than July 1, 2025, pursuant to the Renewal Contracts. Such completion by 2025 would ensure that the natural gas units would be on-line before the current IPP Power Sales Contracts expire in 2027 and after all current debt obligations with respect to the coal-fired power plant have been paid. The current debt for the coal-fired units matures in 2023.

The total costs to LADWP under the Renewal Contracts will depend on the final generation share that will be adopted by LADWP. The balance of the generation costs under the Renewal Contracts will be paid by the other IPP participants. The cost estimates will be determined in greater detail well before construction commences. Initial planning estimates for the total cost of an 840 MW natural gas combined cycle facility are approximately \$840M, based on engineering estimates of \$1 million or more per MW. This represents a savings of approximately \$360-\$400 million resulting from the downsizing of the project from 1,200 MW to 840 MW, which can be utilized to purchase renewable energy. LADWP proposes to pay down the generating units first and then pay down the transmission assets over the remaining life of bonds utilized to finance the project.

LADWP's expedited plan to fund the generating units first is proposed to ensure that the units can experience an early ramp down. LADWP proposes that debt on the two units will be front loaded, meaning that the bonds used to finance the project will first pay off the generating units over approximately ten years, and the transmission assets will be paid for over the remaining years of the bonds. This financing mechanism allows LADWP's portion of the two generating units to be removed from service after debt associated with them have been repaid without having any generation related impact on rates. The units will not be operated in the future solely to sell power to another utility, nor will LADWP's ownership share be sold to another utility at the end of LADWP's operating period. Once LADWP's majority ownership share in the generators is retired, other IPA members may only utilize the plant up to their ownership thresholds.

## **ALTERNATIVES CONSIDERED**

If the Alternative Repowering is not approved, the current provisions of the IPP contracts would dictate moving forward with the 1,200 MW repowering project. It is not financially feasible to withdraw from the project as potential liability to LADWP customers could cost billions of dollars.

The approvals of the Second Amendatory Power Sales Contract in 2015 (which amended the IPP Power Sales Contract, DWP Agreement No. 10437, to allow for LADWP's complete divesture from coal-fired generation) and the Renewal Power Sales Contract in 2017, authorized by the Board and the Los Angeles City Council, were an integral step in maintaining LADWP's transmission rights in IPP's transmission systems past the current contract expiration date of June 15, 2027. The Renewal Power Sales Contract with the IPA, effective January 16, 2017, extended LADWP's participation in IPP until June 15, 2077. IPP's 2,400 MW STS is a crucial asset to give LADWP a transmission path to bring in renewable energy from the region as well as transmission connections to other western states through the Mona and the Gonder transmission lines that are part of IPP's NTS.

The Second Amendatory Power Sales Contract currently provides for IPP to be repowered from coal to natural gas, where the project size would be reduced one-third from the current 1,800 MW size to 1,200 MW, which corresponded to a GHG emission reduction of about 75 percent. This Alternative Repowering would further reduce the project size to less than one-half of the current 1,800 MW size with a GHG emissions reduction of about 83 percent from the current IPP project. The natural gas combined-cycle units are needed in this location to reliably operate the converter stations on each end of the STS at Delta, Utah and Adelanto, California and are also needed in order to reliably integrate renewable energy imports from outside California.

## **ENVIRONMENTAL DETERMINATION**

Determine item is exempt pursuant to California Environmental Quality Act (CEQA) Guidelines Section 15301, 15302, and 15061(b)(3). In approving the Renewal Contracts to authorize IPP to be repowered from coal to natural gas and to reduce the current 1,800 MW output to 1,200 MW, LADWP determined that the repowering was exempt from the California Environmental Quality Act (CEQA) pursuant to CEQA Guidelines



sections 15301, 15302, and 15061(b)(3). Before LADWP, as an IPP Participant, may participate in a potential vote on an Alternative Repowering to reduce LADWP's existing contractual commitment under the Renewal Contracts from approximately 1,200 MW to 840 MW, the Board must first delegate authority to LADWP to exercise its contractual voting rights on an Alternative Repowering. Board action authorizing LADWP to participate in a potential vote on an Alternative Repowering in consideration of all information available at the time of such future vote does not constitute approval of a project pursuant to CEQA.

### **CITY ATTORNEY**

The Office of the City Attorney reviewed and approved the Resolution as to form and legality.

### **ATTACHMENT**

- Resolution



WHEREAS, the Second Amendatory Power Sales Contract also provides for the possibility of an EPS-compliant Alternative Repowering, where one or more modified versions of or alternatives to the gas repowering could be authorized pursuant to majority approval of IPP participants; and

WHEREAS, pursuant to Resolution 15-232 and Ordinance No. 183818, the Board must delegate authority to LADWP, as an IPP participant, before LADWP may exercise its contractual voting rights on an Alternative Repowering; and

WHEREAS, pursuant to Resolution 15-232 and Ordinance No. 183818, the Board's delegation of authority to LADWP concerning any potential vote on an Alternative Repowering does not commit LADWP to act in any specific manner on an Alternative Repowering; and

WHEREAS, LADWP, as an IPP participant, desires to exercise its contractual voting rights on an Alternative Repowering which would reduce the planned gas repowering project from 1200 MWs to 840 MWs of EPS-compliant natural gas-fired generation.

NOW, THEREFORE, BE IT RESOLVED, that the Board authorizes LADWP as an IPP participant, to exercise its contractual voting rights on an Alternative Repowering plan under the Second Amendatory Power Sales Contract and Renewal Contracts that would reduce the currently planned repowering of IPP from 1800MWs of coal-fired generation to no more than 1200 MWs of EPS-compliant natural gas-fired generation to an even smaller project of 840 MWs of EPS-compliant natural gas-fired generation.

I HEREBY CERTIFY that the foregoing is a full, true, and correct copy of the resolution adopted by the Board of Water and Power Commissioners of the City of Los Angeles at its meeting held

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Secretary

APPROVED AS TO FORM AND LEGALITY  
MICHAEL N FEUER CITY ATTORNEY

**MAY 09 2018**

By

  
VAUGHN MINASSIAN  
DEPUTY CITY ATTORNEY

RESOLUTION NO. \_\_\_\_\_

WHEREAS, by Resolution No. 512 dated April 3, 1980, the Board of Water and Power Commissioners (Board) requested the Los Angeles City Council (City Council) to authorize the General Manager of the Los Angeles Department of Water and Power (LADWP) or his designated representative to authorize the Board, in its discretion, to enter into LADWP Agreement No. 10437, Power Sales Contract, to purchase coal-fired generation from the Intermountain Power Project (IPP); and

WHEREAS, by Ordinance No. 153,889, passed by the City Council on May 15, 1980, the City Council provided such authorization; and

WHEREAS, by Resolution 220 dated January 20, 1983, the Board authorized an Amendatory Power Sales Contract as an amendment to DWP Agreement No. 10437; and

WHEREAS, by Ordinance No. 157464, passed by the City Council on February 4, 1983, the City Council provided such authorization; and

WHEREAS, by Resolution 15-232 dated June 2, 2015, the Board authorized the Second Amendatory Power Sales Contract as an amendment to DWP Agreement No. 10437 and the delegation of authority to enter into the Renewal Power Sales Contract and the Agreement for Sale of Renewal Excess Power (Renewal Contracts); and

WHEREAS, by Ordinance No. 183818, passed by the City Council on August 18, 2015, the City council provided such authorization; and

WHEREAS, current California state law prohibits California utilities from entering into new or renewed long-term contracts that do not meet certain emission performance standards (EPS); and

WHEREAS, IPP cannot comply with California state law unless the fuel source is changed from coal to EPS-compliant natural gas; and

WHEREAS, the Second Amendatory Power Sales Contract, which further amended DWP Agreement No. 10437, currently provides for the repowering of IPP's fuel source from its current 1800 Megawatts (MWs) of coal-fired generation to approximately 1200 MWs of EPS-compliant natural gas-fired generation; and

WHEREAS, on October 19, 2016, pursuant to Order No: 16-1019-3, the California Energy Commission found the proposed repowering of IPP from its current 1800 MWs of coal-fired generation to approximately 1200 MWs of EPS-compliant natural gas-fired generation gas repowering to be EPS-compliant and in compliance with California state law; and