

Agenda Report

June 20, 2022

TO: Honorable Mayor and City Council
FROM: Water and Power Department
SUBJECT: ADOPTION OF THE POWER DELIVERY MASTER PLAN

RECOMMENDATION:

It is recommended that the City Council:

1. Find that the proposed action is exempt from the California Environmental Quality Act ("CEQA") in accordance with State CEQA Guidelines Section 15262 (Feasibility and Planning Studies) and, therefore, no environmental document is required; and
2. Approve and adopt the 2022 Power Delivery Master Plan.

BACKGROUND:

The Power Delivery Master Plan ("PDMP") provides a high-level guide for planning, operating, and maintaining the electric distribution system for the City of Pasadena Water and Power Department ("PWP") over the next two decades. The plan also identifies the long-term outlook of the electric utility, assesses its current conditions, and provides an ambitious capital improvement plan to address current and future challenges all designed to increase reliability, safety, and improve cost effectiveness.

The power utility industry continues to evolve and PWP has to accommodate power flowing in two directions, to and from consumers, without compromising safety and reliability. Today, power flows across the electrical grid from a growing number of resources such as traditional power plants, solar farms, and utility scale battery storage systems in one direction to customer load, and customer-owned rooftop solar panels, fuel cells, and wall-mounted battery storage systems often flow back to the utility. PWP's power distribution system must continue to evolve to meet current and future needs and technological advances. PWP must also adapt to growing risks from extreme natural conditions such as wildfires, heatwaves, and windstorms by making investments in hardening the electric system to make it more resilient.

PWP's electric distribution system is also aging and has a number of power flow challenges that need to be addressed to maintain exceptional electric service reliability records.

PDMP Development Process:

PWP employed a stakeholder approach in developing the PDMP by incorporating internal and external stakeholders consisting of PWP staff, City representatives, community members, and customers. The stakeholders participated in seven planning meetings over a two-year period to discuss system current status and limitations, develop goals, and proposed solutions.

PWP also provided multiple progress reports and solicited feedback from the public, along with briefings for the Municipal Services Committee ("MSC"), and the Environmental Advisory Commission ("EAC"). The PDMP was then developed taking all comments into consideration and the final report was presented to EAC and MSC on April 12, 2022.

PDMP Goals:

- Reliability and Safety
Maintain and reduce outage frequency and duration; maintain and/or replace equipment proactively; reduce electric system risks to the community from wildfires, windstorms, and heatwaves.
- Resiliency
Improve power flow and increase power system import capability and capacity; establish a second interconnection to import power to the City from external sources; reduce the system fault current duty.
- Power Quality
Provide a clean and stable voltage to customer meters between 114 and 126 Volts; complete targeted 4 kV to 17 kV voltage conversion projects.
- Grid Modernization
Improve real-time monitoring, control, analysis, and reporting of the electric system (Automation); implement advanced technologies to allow remote outage detection and restoration capabilities; upgrade protection, monitoring, and control systems and equipment (relays, communications, and operational software).
- Grid Edge
Implement Automated Metering Infrastructure (AMI); expand PWP's Electric Vehicle ("EV") charging infrastructure to meet growing demand.

Major System Challenges and Proposed Solutions:

The PDMP identifies three broad categories of challenges which need to be addressed to allow PWP to continue to provide safe, reliable, and cost-effective service to its customers:

- Replacement of aging infrastructure
As mentioned in the background section, PWP has an exceptional electric service reliability record, but the distribution system is aging and needs continuous attention. PDMP highlights the need for systematic and aggressive replacement of distribution assets (i.e. transformers, power poles, switches, and vaults) to maintain system reliability and safety. For example, a major focus will be on replacement of substation power transformers and their electrical protection, monitoring, and control systems.
- Additional capacity to import and transfer power across the distribution system
PWP's electric distribution system has a limitation to import power from the California Independent System Operator ("CAISO") electric grid ("Grid") of 280 Megawatts ("MW"), whereas the existing Interconnection Agreement allows PWP to import 336 MW of power from the CAISO transmission Grid. The PDMP identified this as a major issue and proposes to replace and upgrade the existing interconnection transformer banks.

PDMP analyses also highlighted the limitation within PWP's internal sub-transmission network to transfer power across its distribution system. The proposed PDMP solution is to replace and upgrade the aging sub-transmission cables at a rate of one sub-transmission line per year.

Another challenge which was identified during the analyses was the fact that PWP has one active interconnection point to the Grid which limits its ability to import power and is susceptible to forced load shedding events directed by the CAISO. PWP has another interconnection with the City of Los Angeles Department of Water and Power ("LADWP") which can potentially import up to 40MW, but the systems are electrically incompatible (out-of-phase) making it impossible to utilize the interconnection without first disconnecting from the Grid. Therefore, PDMP proposes to upgrade the interconnection facilities to allow for import of power from the LADWP system. This would help mitigate potential rolling blackouts should the CAISO call for load shedding events like they did for summer 2020.

- Short circuit duty limitations on sub-transmission system
PWP faces an issue with the maximum available short circuit duty on the sub-transmission (35,000 Volt) system, which may exceed the interrupting ratings of circuit breakers. Short circuit duty is a measurement of how much power flows through a faulted cable or equipment electrical failure. If the short circuit duty exceeds equipment ratings, it could result in severe equipment damage. High short circuit duty occurs as more PWP's generators are brought on-line and

necessitates operating the system in special configurations that are not ideal. The PDMP has a short-term and long-term permanent solution to mitigate the high fault duty.

PWP has determined that existing internal staffing levels, supplemented with outside resources for major projects, are adequate to execute the capital projects outlined in the PDMP and properly maintain and operate the system.

Furthermore, as new technologies and automation are being added to the distribution system (Distribution Automation), special skill sets are needed to properly maintain the automated systems. PWP currently has these skill sets, however, additional resources may be needed as Distribution Automation continues to grow. PWP will closely monitor and analyze this requirement and determine if additional internal resources are needed to address this concern. Any additional resource requirements will be presented to the City Council in the future as part of the City's annual budgeting process.

COUNCIL POLICY CONSIDERATION:

The proposed PDMP is consistent with the Public Facilities Element of the General Plan and supports the Council's goal to improve, maintain and enhance public facilities infrastructure and to implement capital improvements that will maintain and rehabilitate infrastructure.

ENVIRONMENTAL ANALYSIS:

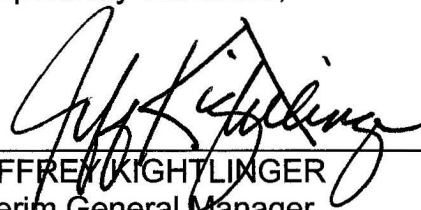
The action proposed herein is exempt from CEQA in accordance with State CEQA Guidelines Section 15262 (Feasibility and Planning Studies), which expresses that planning studies for possible future actions which are not approved, adopted, or funded do not require the preparation of an Environmental Impact Report or Negative Declaration but do require the consideration of environmental factors. As previously noted, the proposed PDMP is a high-level guide for planning, operating, and maintaining the electric distribution system for the City. The plan identifies potential capital improvements to address current and future challenges, all designed to increase reliability and safety, and to improve cost effectiveness. However, approval/adoption of the proposed PDMP does not approve, adopt, or fund any such capital improvements, nor does it commit the City to doing so in the future. Rather, each such project would be subject to an individual approval process, with the appropriate CEQA review, at the time each project is considered for approval, funding, and/or implementation. Adoption of the PDMP would not have a legally binding effect on later activities.

With regard to consideration of environmental factors, a key intention of the PDMP is to accommodate the increasing availability of renewable and other clean power sources, thereby reducing the greenhouse gas (GHG) emissions from the City's energy sector and aiding the City in meeting the GHG reduction targets in the City's Climate Action Plan.

FISCAL IMPACT:

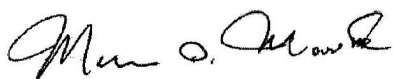
The recommended actions to approve and adopt the PDMP as a planning document will have no immediate fiscal impact. The total estimated expenditures projected in the PDMP is approximately \$813 million over 20 years, averaging \$40.7 million annually. Funding for this action will be addressed by current and future appropriations in the capital and operating budgets.

Respectfully submitted,



JEFFREY KIGHTLINGER
Interim General Manager
Water and Power Department

Prepared by:



Marvin D. Moon
Assistant General Manager
Water and Power Department

Approved by:


CYNTHIA J. KURTZ
Interim City Manager

Attachments: (1)
Attachment A – Power Delivery Master Plan