

Los Angeles Unified School District
Office of the Inspector General

Special Review of the District's Photovoltaic Program

26-0034-SR
May 5, 2026

Michael A. McLean
Interim Inspector General





**Los Angeles Unified School District
Office of the Inspector General**

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May 5, 2026

Mr. Christos Chrysiliou, Chief Eco-Sustainability Officer
Office of Eco-Sustainability
Los Angeles Unified School District
333 S. Beaudry Avenue, 22nd Floor
Los Angeles, CA 90017

Subject: Special Review of the District's Photovoltaic Program

Dear Mr. Chrysiliou:

Enclosed is the final report on our Special Review of the District's Photovoltaic Program.

Please contact our office if you have any questions.

Sincerely,

Amy Long

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Michael A. McLean
Interim Inspector General

cc: Mark Cho, Peter Yee, and Miguel Garcia

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EXECUTIVE SUMMARY

In 2007, the Los Angeles Unified School District (LAUSD or District) Board of Education (BOE or Board) adopted the *Green LAUSD Resolution*, directing the Superintendent to implement measurable sustainability goals and make the District a leader in environmental responsibility. The Sustainability Initiatives Unit (SIU) was established in 2008 under the Facilities Services Division (FSD). In 2023, the Board established the Eco-Sustainability Office (ESO) and appointed a Chief Eco-Sustainability Officer to continue advancing the District's renewable energy goals.

During the years from 2009 through 2017, the District implemented the Photovoltaic (PV) Program¹, awarding contracts to five contractors, Tesla,² Engie,³ Hanwha,⁴ PermaCity,⁵ and SunPower,⁶ to design, procure, and install 62 PV systems across 61 sites (See Appendix II – Listing of Photovoltaic Programs and True-Up Periods). The total program cost was \$136.3 million, funded through voter-approved bonds, LADWP settlements, and utility rebates.

Four of the five contractors entered into agreements that included 10-year performance guarantees covering 54 of the systems installed. Under these agreements, contractors were obligated to ensure that each system met specified production benchmarks for 10 years. At scheduled intervals, contractors were required to compare actual energy generation against guaranteed levels. If a system's production fell short for the true-up periods, the contractor was responsible for issuing a true-up payment to the District to compensate for the shortfall.

In addition, all five contractors entered into O&M agreements for the systems they installed. These O&M agreements require the contractors to perform a range of services designed to keep the systems functioning at optimal levels, such as conducting preventive maintenance, washing solar modules, and providing other upkeep activities throughout the contract period.

Following the initial rollout, the OIG conducted a performance audit of the PV Program, issuing a [Report No. CA 20-1269](#) on February 18, 2021.⁷ The audit identified areas for improvement, including the accuracy of energy production estimates, contractor compliance with performance guarantees, and the timeliness of reporting and maintenance activities.

¹ A PV Program refers to an organized initiative, plan, or system designed to implement, promote, or research the use of photovoltaic technology for generating electricity. This involves converting light directly into electrical energy using solar cells, commonly known as solar panels.

² The District awarded four contracts, Contract Nos. 1180017, 1290019, 1290094, and 1490014, to SolarCity Corporation (SolarCity) between 2011 and 2013. SolarCity then merged with Tesla, Inc. (Tesla) in 2016.

³ District awarded two contracts, Contract No. 1180016 and 1290017, to Chevron Energy Solutions Company (Chevron) in 2011. In 2014, Chevron sold substantially all of its assets used in the operation of its business to OpTerra Energy Services, Inc. (OpTerra) and assigned both contracts to OpTerra. OpTerra was acquired by Engie Corporation (Engie) in earlier 2016.

⁴ The District awarded Contract No. 1290018 to Komodo Enterprises, Inc. dba Solar Monkey in 2011. Komodo Enterprises changed its dba to Hanwha Q CELLS USA, Corp. (Hanwha) in 2013.

⁵ The District awarded Contract Nos. 1180019 and 1290016 to PermaCity Construction Corp. (PermaCity) in 2011 and 2012, respectively.

⁶ The District awarded Contract Nos. 0980025 and 1180018 to SunPower in 2009 and 2011. Contract No. 1180018 was later terminated in 2013 and the PV system installation projects included in Contract No. 1180018 were then awarded to SolarCity/Tesla under Contract No. 1490014.

⁷ CA 20-1269, OIG Performance Audit Report of the Photovoltaic Program, February 18, 2021

For this special review, the OIG evaluated the state of the District’s PV Program from July 1, 2020, through June 30, 2025, and followed up on ESO’s status with implementing the agreed-upon recommendations in the aforementioned performance audit report. The OIG identified missed financial benefits, reduced energy generation, and systemic weaknesses in the oversight, monitoring, and maintenance of the District’s PV Program, resulting in noncompliance with contractual obligations, estimated⁸ **\$616,114** in guaranteed payments owed to the District for PV systems that failed to meet the contractual guaranteed performance, and **\$1,816,174** of paid operations and maintenance services that were not rendered. Furthermore, the OIG determined that the ESO has not established comprehensive monitoring processes, clear accountability, or timely follow-up mechanisms to ensure program effectiveness. The OIG identified true-up reports⁹ that have not been submitted by contractors and true-up reports that were not consistently reviewed by the ESO. Overall, the OIG identified the nine findings and issued 19 corresponding recommendations.

Furthermore, while ESO concurs with all findings and recommendations, implementation is currently hindered by critical staffing shortages – specifically, the vacant Energy Specialist and Senior Energy Specialist roles. Following a denied request for personnel in October 2025, ESO has not submitted a subsequent request to the LAUSD Personnel Commission (Personnel Commission). ESO is in the process of implementing technological solutions, including a centralized, cloud-based monitoring and reporting system. However, according to ESO, full-time management, support, and monitoring of the system remains contingent upon the hiring of the Energy Specialist and Senior Energy Specialist positions. This contingency is applicable to all action plans stipulated by the ESO in response to the findings and recommendations below.

Finding No. 1 – Actual Energy Production Was Below Expected Levels: Actual solar energy production was significantly lower than expected due to periods of system downtime and various operational issues, such as broken panels and delayed repairs.

Recommendation 1.1 – ESO should implement a centralized process to monitor PV system performance, reconcile actual versus expected energy output, document downtime, and verify contractor true-up adjustments.

ESO’s Response – ESO agrees with the finding and recommendation and stated that it will implement a centralized monitoring system by October 1, 2026.

Recommendation 1.2 – ESO should coordinate with the District’s Maintenance & Operations (M&O) Technical Unit to confirm the field conditions reported by contractors. For sites with prolonged equipment issues, ESO should coordinate with M&O Technical Unit and contractors to expedite repairs.

⁸ This amount does not include any weather-related adjustments. Under the Performance Guarantee, the accrual/payment for each true-up period is calculated using a prescribed formula that incorporates a weather adjustment factor based on Site-Specific Expected Annual Meteorological Conditions (SEAMC) and Site-Specific Expected Test Meteorological Conditions (SETMC). These adjustments are intended to normalize the effects of weather variability experienced during the applicable true-up period.

⁹ In PV contracts, particularly those with performance guarantee agreements, a true-up report is a formal accounting and verification document prepared, typically annually or at the end of a defined “true-up period,” to reconcile actual energy production of a solar system against the guaranteed production levels specified in the contract.

ESO's Response – ESO agrees with the finding and recommendation and stated that it will coordinate with the District's M&O Technical Unit to define roles and responsibilities on how to confirm repairs and how to coordinate and monitor service calls. ESO will develop internal procedures and checklists by July 1, 2026.

Finding No. 2 – Actual Energy Saving Was Below the Estimates: Actual solar generation over the first 10 years totaled approximately 224.0 million kWh, compared to 311.0 million kWh projected by the FSD. This underperformance reduced the District's expected financial benefits, yielding \$37.86 million in savings, or \$15.18 million less than anticipated.

Recommendation 2.1 – ESO should establish a centralized dashboard to monitor energy generation, efficiency trends, cost savings, and utilize verified performance data from existing systems to inform future PV project planning and decisions.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it will implement a centralized monitoring system by October 1, 2026.

Recommendation 2.2 – ESO should verify any claimed production adjustments by reviewing supporting documentation, historical performance data, and calculations that account for panel degradation and actual weather conditions.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it will implement a centralized monitoring system by October 1, 2026.

Finding No. 3 – Outstanding Guarantee Payments for Underperforming Solar Systems: Several District PV systems failed to meet the contractual guaranteed performance threshold of 95% of expected energy production, resulting in an estimated **\$616,114** in guaranteed payments owed to the District.

Recommendation 3.1 – ESO should recover the \$616,114 in underpaid guaranteed payments from the responsible contractors.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it will request delinquent true-up reports from solar vendors and determine the appropriate guaranteed payment based on actual production and the applicable weather adjustment factor by July 1, 2026. ESO further stated that they will collect shortfall payments from the contractor if the PV system underperformed.

Recommendation 3.2 – ESO should assign specific staff within the ESO to oversee performance guarantee compliance, including the review of true-up reports, calculation of the Accrual/Payment for each true-up period (including adjustment factor such as SEAMC/SETMC), verification of contractor calculations, and tracking of payments owed or received. In addition, standardized monthly procedures with defined timelines, responsibilities, and documentation should be established to ensure consistency and accountability.

ESO's Response – ESO agrees with the finding and recommendation and indicated that assigning staff to oversee performance guarantee compliance is dependent on the approval of the vacant Energy Specialist and Senior Energy Specialist positions.

Finding No. 4 – Lack of Active Monitoring of Guaranteed Energy Production: The ESO has not established a formal process to monitor guaranteed energy production, reconcile actual versus expected output, or pursue payments for contractor underperformance. Despite having access to production data, ESO does not consistently review true-up reports, validate results, or document follow-up with contractors.

Recommendation 4.1 – ESO should implement a formal monitoring process and standardized protocol to routinely compare actual energy production with contractual guarantees, including data collection and validation of true-up reports.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it will implement a centralized monitoring system by October 1, 2026.

Recommendation 4.2 – ESO should develop a centralized dashboard to track PV performance data (expected versus actual production, shortfalls, and payments) and maintain a record of related documentation and reconciliations.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it will implement a centralized monitoring system by October 1, 2026.

Finding No. 5 – Delayed and Missing True-Up Reports: Of the 41 true-up reports due from solar contractors, only 16 (39%) were received, and all were submitted late. While Engie eventually provided all 16 reports, Tesla, Hanwha, and PermaCity had multiple missing or overdue submissions. As a result, the District was unable to timely verify whether contractors met the guaranteed performance thresholds or owed compensation for underproduction, exposing the District to potential financial losses and reduced oversight of solar program performance.

Recommendation 5 – ESO should assign staff to manage and monitor all contractor true-up reports and implement a centralized tracking system that records due dates and receipt statuses. The assigned staff should also proactively request missing reports when due and perform follow-up procedures to ensure the timely submission of the true-up reports.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it will request delinquent true-up reports from solar vendors by July 1, 2026 and implement a centralized monitoring system by October 1, 2026.

Finding No. 6 – Lack of Review and Oversight of Energy Production Database: Although contractors provided the ESO with access to web-based data acquisition systems (DAS)¹⁰ for real-time solar performance monitoring, ESO has not been actively reviewing or verifying production data.

Recommendation 6.1 – ESO should develop written procedures defining monitoring frequency, variance thresholds, and notification protocols for declining energy output.

ESO’s Response – ESO agrees with the finding and recommendation and indicated that it will develop these parameters and incorporate them into the centralized monitoring and reporting system by October 1, 2026.

Recommendation 6.2 – ESO should assign staff to routinely monitor and verify energy production data from each contractor’s web-based DAS.

ESO’s Response – ESO agrees with the finding and recommendation and indicated that it will develop a schedule to spot check and compare data collected by the centralized system against the solar contractors’ web-based data acquisition systems by October 1, 2026.

Recommendation 6.3 – ESO Management should conduct periodic reviews to ensure monitoring is consistent and system issues are promptly resolved to maintain optimal energy generation.

ESO’s Response – ESO agrees with the finding and recommendation and indicated that it will set parameters in the centralized system to send alarms if production falls below certain predetermined levels by October 1, 2026.

Finding No. 7 – Lack of Oversight and Preventive Maintenance: From July 1, 2020, to June 30, 2025, the contractors failed to meet preventive maintenance (PM) requirements, completing only 12 of 470 scheduled services, a compliance rate of 2.55%. Contractors such as Tesla and Hanwha reported no PM activity, while PermaCity and Engie completed six each.

Recommendation 7 – ESO and M&O should develop a centralized system to track all PV operations and maintenance (O&M) activities, including panel washing and preventive maintenance. The system should:

- Record site-level service details, contractor, and verification.
- Require uploads of supporting documents (logs, reports, photos).
- Clarify ESO–M&O roles and data ownership through formal procedures to ensure accountability.

¹⁰ DAS is a system that displays historical meteorological and production data over an internet connection and consists of hardware located on-site and software housed on the DAS server. The DAS measures and logs actual Alternating Current (AC) electricity production of the system of each school site (in kWh), solar irradiance (in W/m²), temperature (in C), and wind speed (in meters per second).

ESO's Response - ESO agrees with the finding and recommendation and indicated that M&O Technical Unit will take the lead in scheduling and monitoring the annual panel washings and annual preventative maintenance services. M&O Technical Unit will also utilize Maximo to track all service calls and work orders, and implement a tracking spreadsheet for these service calls and work orders by November 1, 2026. Furthermore, ESO will assist with document review and contractual support.

Finding No. 8 – Panel Washing Services Not Performed as Required: Between July 1, 2020, and June 30, 2025, the contractors completed only 17 of 275 required panel washing services, a compliance rate of 6.18%. Contractors such as Tesla did not perform any of their scheduled cleanings, while others showed minimal activity. The widespread failure to perform panel washing reflects serious lapses in contractor compliance and oversight.

The District incurred an average annual cost of \$386,834 for O&M activities such as PM and Panel Washing (PW) services, for a total of \$1,934,171 during the five-year scope of this review. However, of the total of 745 required O&M activities (i.e., 470 PM services and 275 PW services), only 29 (12 PM services and 17 PW services) were performed, representing a service completion rate of 3.89%. Although the District paid \$386,834 for annual O&M activities, only 3.89% of the O&M activities were rendered, equating to an annual value of \$363,235 of O&M services not performed, or \$1,816,174 over the five-year period. The District should be reimbursed **\$1,816,174** for O&M services not rendered.

Recommendation 8.1 – ESO should require contractors to submit updated service plans detailing how they will make up missed washes and maintain future compliance.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it will schedule a meeting with each vendor to discuss this by July 1, 2026.

Recommendation 8.2 – ESO should implement a centralized tracking system with real-time monitoring, automated alerts, digital service logs, and audit-ready reporting features.

ESO's Response - ESO agrees with the finding and recommendation and indicated that it will implement a centralized monitoring system by October 1, 2026.

Recommendation 8.3 – ESO should prioritize site inspections for locations that have gone multiple years without documented panel washing and determine whether performance degradation and equipment damage are due to a lack of cleaning.

ESO's Response - ESO agrees with the finding and recommendation and indicated that through the centralized monitoring system, it will prioritize those sites with missed panel washing, compare actual production data against guaranteed production, and take appropriate action by October 1, 2026.

Recommendation 8.4 – ESO should recover \$1,816,174 of O&M activities that were not rendered by the contractors.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it will schedule meetings with each solar vendor to address outstanding issues by July 1, 2026. Furthermore, at these meetings, ESO will discuss delinquent true-up reports, PV systems that are not producing or reporting, and missed annual PM and PW services. ESO will allow solar vendors the option of extending PM and PW services beyond the 20-year O&M agreement to make up for missed services, or reimbursing LAUSD.

Finding No. 9 – Prior Audit Recommendations Not Implemented: A follow-up review found that six of 12 prior recommendations were not implemented, two were partially implemented, and four were fully implemented. ESO attributed the lack of progress to staffing and funding constraints.

Recommendation 9.1 – ESO should assess all 12 prior recommendations, prioritize those with the greatest impact on compliance, cost savings, and program effectiveness, and establish clear and achievable implementation timelines with interim milestones to ensure sustained progress.

ESO's Response - ESO agrees with the finding and recommendation and indicated that it has reviewed the prior recommendations and cross-referenced them against current, similar recommendations to combine as one task for prioritization and tracking. ESO indicated that this implementation will be ongoing.

Recommendation 9.2 – ESO should implement a monitoring and reporting mechanism to track the status of each outstanding recommendation, provide regular progress updates (e.g., quarterly) to ESO Management, and conduct periodic internal reviews to evaluate the effectiveness of newly implemented procedures and make adjustments as needed.

ESO's Response - ESO agrees with the finding and recommendation and indicated that it will track the combined recommendations and will regularly assess and review the effectiveness of renewed procedures and efforts to address all open recommendations. ESO indicated that this implementation will be ongoing.

BACKGROUND INFORMATION

The District launched a comprehensive PV Program to support its sustainability goals and reduce long-term energy costs. The program involved installing solar energy systems, managed by the FSD, at school sites to generate clean electricity, lower utility expenses, and promote environmental responsibility. These installations were governed by formal agreements that outlined expectations for energy production, cost savings, and contractor responsibilities.

The current review covered the period from July 1, 2020, through June 30, 2025, and aimed to determine whether: (1) The PV systems' actual energy production met the estimated production reported by FSD, (2) The contractors complied with the requirements specified in the Performance Guarantee Agreements, (3) The contractors provided true-up reports on time, (4) The contractors provided O&M services as required by the contracts, and (5) Each recommendation and agreed-upon action from the February 18, 2021 performance audit of the PV Program was fully implemented, partially implemented, not implemented, or addressed through alternative actions.

Moreover, according to the ESO organizational chart (see Appendix IV), the ESO consists of 10 filled positions (District employees), eight contracted positions, and eight vacant positions. One of the filled positions is the Energy and Sustainability Program Manager, who "...develops, supervises, and executes District-wide energy and sustainability programs,"¹¹ and should have four direct reports (i.e., two Energy Specialists and two Senior Energy Specialists). However, all four energy specialist positions remain vacant. For the entirety of this special review, one ESO Senior Project Manager (a contracted professional) was the OIG's point of contact. As the ESO Management Team responds to these findings and recommendations, the OIG strongly encourages the ESO Management Team to specify the ESO job position(s) who will be responsible for implementing each agreed-upon recommendation. For Finding No. 7 below, FSD Maintenance and Operations (M&O) should specify the job position(s) who will be responsible for implementing Recommendation 7.

¹¹ [LAUSD Job Class Description - Energy and Sustainability Program Manager](#)

SPECIAL REVIEW – FINDINGS AND RECOMMENDATIONS

I. The PV Systems’ Actual Energy Production Did Not Meet the Estimated Production Reported By FSD.

Finding No. 1 – The Actual Energy Production was Less than the Estimated Energy Production

The FSD reported completing 62 solar projects with a total estimated capacity of 20.9 MW, projected to save the District about \$112 million in utility costs over 20 years (See Appendix III). Using the PVWatts® calculator (<https://pvwatts.nrel.gov/index.php>), FSD estimated first-year production of 32.5 million kWh (with a 1% annual degradation rate), projecting a 20-year total output of 592.3 million kWh. To provide an estimated savings, FSD used the average retail blended electricity rate to estimate its savings. We reviewed actual versus estimated production for the 10-year period of each site’s operation, using contractor-provided web-based DAS and true-up reports to compare real production with District estimates. We found that the PV systems underperformed relative to expectations. Cumulatively, the system generated 224.0 million kWh compared to 311.0 million kWh projected, resulting in an overall shortfall of 86.99 million kWh, or 27.97 percent below expectations for the first 10 years. Annual deficits ranged from 13.35% to 52.53%, with performance declining significantly over time and the largest gap occurring in Year 10. A summary of the data is provided within the table below.

Year	Estimated Annual Alternating Current (AC) Energy (kWh)	Actual Energy Produced	Difference Between Estimated and Actual	% Difference
1	32,526,512	28,183,922	4,342,590	13.35%
2	32,201,247	26,723,772	5,477,475	17.01%
3	31,879,234	26,980,146	4,899,088	15.37%
4	31,560,442	25,634,411	5,926,031	18.78%
5	31,244,838	24,482,464	6,762,374	21.64%
6	30,932,389	20,715,909	10,216,480	33.03%
7	30,623,065	19,565,544	11,057,521	36.11%
8	30,316,835	16,988,757	13,328,078	43.96%
9	30,013,666	20,632,978	9,380,688	31.25%
10	29,713,530	14,104,399	15,609,131	52.53%
Total	311,011,758	224,012,302	86,999,456	27.97%

Some of the key factors contributing to underproduction include:

- Natural degradation of PV panels, resulting in reduced energy output over time.
- Inconsistent O&M practices, such as infrequent panel washing, delayed repairs, and inadequate preventive maintenance.
- Data inaccuracies and incomplete monitoring are caused by gaps or malfunctions in contractor-provided monitoring systems.
- Suspension of energy production data during the District’s cybersecurity attack, which disrupted system reporting.
- Damage caused by District contractors, including incidents where underground conduits were struck, requiring PV system shutdowns.

In addition, our review of the true-up reports identified events that contributed to reduced or interrupted energy production as follows:

- Construction-related outages caused by District contractors.
- Damage from a truck accident, repaired on June 29, 2021.
- Underground conduit struck by a District contractor, requiring the PV system to be shut down.
- Truck accident at Westchester on March 2, 2017, taking three strings offline (approximately 2% of the system).
- Inverters were disabled following an attempted theft.
- Wind damage resulting in reduced energy production.

Furthermore, on one of the true-up reports received from the contractor, they indicated that a school “...has had a large number of (32+) broken modules since 2017. We are including the loss of generation capacity only for 2020. An estimate to replace these modules has been provided to the District, and we have had no response from the District.”

Recommendation 1.1 – ESO should establish a centralized monitoring process to track energy production performance across all PV systems. This should include periodic reconciliation of actual energy output against expected production, and documentation of system downtime events.

ESO’s Response – ESO agrees with the finding and this recommendation and stated that it will implement a centralized process for monitoring PV system performance, reconciling actual versus expected energy output, and verifying contractor true-up adjustments. ESO indicated that when the PV Program began, the District’s sustainability function was managed under M&O. After ESO became a cabinet-level department, responsibility for PV systems became divided between the two units. Since December 2020, ESO has requested approval to fill the vacant Senior Energy Specialist and Energy Specialist positions needed to support these duties, but the positions remain unfilled. According to ESO, the most recent request to the Personnel Commission was submitted in February 2025, and the most recent denial to reopen the positions was received in October 2025.

ESO further stated that it is working with a consultant to develop and implement a centralized, cloud-based reporting and monitoring system. The system will be capable of collecting real-time production data, analyzing and comparing historical production and savings against baseline data, and generating automated alerts when systems are not producing or are underperforming. The system will enable ESO and the M&O Technical Unit to promptly investigate and address issues. Additionally, the system will incorporate weather-adjustment factors to improve the accuracy and reliability of overall performance analysis.

ESO stated that it will implement a centralized monitoring system by October 1, 2026, and explained that support and monitoring will commence six months following the Personnel Commission’s approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

Recommendation 1.2 – ESO should coordinate with the M&O Technical Services Unit to verify field conditions when reported by the solar contractors. For sites with prolonged equipment damage or unaddressed module replacement (e.g., 32+ broken panels since 2017), ESO should coordinate with M&O and the contractor to expedite repair approval, funding, and scheduling.

ESO’s Response – ESO agrees with the finding and recommendation and stated that it will coordinate with the District’s M&O Technical Unit to define roles and responsibilities on how to confirm repairs and how to coordinate and monitor service calls. ESO will develop internal procedures and checklists by July 1, 2026.

Finding No. 2 – Actual Energy Savings Did Not Meet the Estimated Savings by FSD

We also calculated FSD’s estimated savings and actual savings using the production data captured from contractor-provided web-based data acquisition systems for the first 10 years of operation. Our analysis found that actual solar production totaled approximately 224.0 million kWh, compared with the 311.0 million kWh expected, representing a 28.62% shortfall in energy generation. This underproduction directly impacted the District’s financial benefits. Based on actual energy production and corresponding electric rates, the District realized cumulative savings of approximately \$37.86 million, which was \$15.18 million less than the \$53.04 million in projected savings during the same 10-year period. Below is a summary of the actual savings for each contractor.

Year	Estimated Annual Alternating Current Energy (kWh)	Electric Rate (\$/kWh)	Expected Savings	Actual Energy Produced	Actual Savings	Difference
1	32,526,512	\$0.156	\$ 5,074,136	28,183,922	\$ 4,396,692	\$ 677,444
2	32,201,247	\$0.159	5,123,862	26,723,772	4,249,080	874,782
3	31,879,234	\$0.162	5,174,076	26,980,146	4,370,784	803,292
4	31,560,442	\$0.166	5,224,782	25,634,411	4,255,312	969,470
5	31,244,838	\$0.169	5,275,985	24,482,464	4,137,536	1,138,449
6	30,932,389	\$0.172	5,327,690	20,715,909	3,563,136	1,764,554
7	30,623,065	\$0.176	5,379,901	19,565,544	3,443,536	1,936,365
8	30,316,835	\$0.179	5,432,624	16,988,757	3,040,988	2,391,636
9	30,013,666	\$0.183	5,485,864	20,632,978	3,775,835	1,710,029
10	29,713,530	\$0.186	5,539,625	14,104,399	2,623,418	2,916,207
Total	311,011,758		\$ 53,038,545	224,012,302	\$ 37,856,317	\$ 15,182,228



We found that ESO did not track year-over-year energy generation, nor did they routinely request or review the contractor-provided true-up reports. These reports were only obtained after the OIG requested them. According to ESO, the lack of ongoing monitoring was due to staffing and funding constraints that limited their capacity to review energy production data and evaluate related performance adjustments.

Recommendation 2.1 – ESO should develop a centralized reporting dashboard to track year-over-year energy generation, degradation trends, and cost savings to inform decision-making and future project planning. Furthermore, ESO’s decisions regarding new PV installations should be based on a thorough evaluation of the actual savings achieved from existing systems.

ESO’s Response – ESO agrees with the finding and recommendation and stated that it is working with a consultant to develop and implement a centralized, cloud-based reporting and monitoring system. The system will be capable of collecting real-time production data, analyzing and comparing historical production and savings against baseline data, and generating automated alerts when systems are not producing or are underperforming. The system will enable ESO and the M&O Technical Unit to promptly investigate and address issues. Additionally, the system will incorporate weather-adjustment factors to improve the accuracy and reliability of overall performance analysis.

ESO stated that it will implement a centralized monitoring system by October 1, 2026, and explained that support and monitoring will commence six months following the Personnel Commission’s approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

Recommendation 2.2 – For any claimed adjustments, the ESO should request and review backup documentation and calculations to support the production shortfall. This includes

reviewing historical production data and applying it to the present time, taking into account panel degradation and actual weather conditions.

ESO’s Response – ESO agrees with the finding and recommendation and stated that it is working with a consultant to develop and implement a centralized, cloud-based reporting and monitoring system. The system will be capable of collecting real-time production data, analyzing and comparing historical production and savings against baseline data, and generating automated alerts when systems are not producing or are underperforming. The system will enable ESO and the M&O Technical Unit to promptly investigate and address issues. Additionally, the system will incorporate weather-adjustment factors to improve the accuracy and reliability of overall performance analysis.

ESO stated that it will implement a centralized monitoring system by October 1, 2026, and further explained that support and monitoring will commence six months following the Personnel Commission’s approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

II. The Contractors Did Not Comply with the Requirements Specified in the Performance Guarantee Agreements

Finding No. 3 – Outstanding Guaranteed Payments Due to Underperformance in Solar Energy Productions

The District entered into 10-year performance guarantee agreements with Tesla, Engie, Hanwha, and PermaCity covering a total of 54 PV systems installed by these contractors. Under these agreements, each contractor is required to ensure that the PV systems achieve specified annual energy production levels. The agreements define the guaranteed production terms and conditions, including designated true-up periods during which the contractors must report on actual system performance. If the actual energy production falls below the guaranteed levels during a true-up period, the contractor must issue a guarantee (true-up) payment to the District to compensate for the shortfall. The 10-year guarantee term begins once the respective PV system becomes operational.

Our review of the true-up calculation process for solar energy production across multiple school sites revealed that several locations did not meet the guaranteed production threshold of 95% of expected output. Using expected production values, current utility rates, and actual performance data obtained from contractor monitoring platforms and true-up reports, the analysis from July 1, 2020, through June 30, 2025, determined that the District is owed a total estimated amount of **\$616,114** in guaranteed payments. These payments remain outstanding.

Per the solar energy service agreements, contractors are contractually required to deliver at least 95% of the expected annual energy production. If actual production falls short, the contractor must compensate the District for the shortfall, calculated as:

$$(\text{Guaranteed Production} - \text{Actual Production}) \times \text{Current Utility Rate}$$

The table below summarizes the outstanding amounts owed by each contractor, along with the source of data used for the analysis:

Contractors ¹²	Guaranteed Production	Actual Production	Under (Over) Production	Amount Due to District
PermaCity	20,924,121	18,243,375	2,660,746	\$ 362,346
Tesla	4,786,199	3,776,481	1,009,718	181,692
Engie	80,240,811	81,556,222	(1,315,411)*	72,076
Hanwha**	11,764,518	10,399,357	1,365,161	-
Total	117,715,649	113,975,435	3,720,214	\$ 616,114

*Although the actual production exceeded the guaranteed production, underproduction payments are based on the true-up period. Payment or credit is issued at the end of each true-up period based on the net underproduction.

**Although Hanwha underproduced, the energy was true-up with the other period for which they overproduced. Hanwha has not yet submitted the eight required true-up reports. Therefore, the District may be entitled to additional guaranteed payment amounts once those reports are completed and reviewed.

The results of our analysis are summarized as follows:

PermaCity

Overall, all five sites for PermaCity produced less energy than guaranteed under the performance agreements, resulting in a total shortfall of 2.66 million kWh, equivalent to approximately \$426,538 in guaranteed payments owed to the District. Of this total, contractors have remitted \$64,192, leaving a remaining balance of \$362,346 due. The table below is a summary of energy production and the amount due to the District.

	School/Site	Guaranteed Production	Actual Production	Under Production	Amount Due to District
1	Gardena Bus Garage (1404)	4,179,810	3,482,574	697,236	\$ 84,955
2	Sonia Sotomayor Arts and Sciences Magnet	6,007,265	5,282,890	724,375	130,927
3	Glenn Hammond Curtiss Middle School	5,100,142	4,398,934	701,208	107,924
4	Orthopedic Hospital Senior High Medical Magnet	3,190,154	2,834,191	355,963	83,837
5	Maywood Center for Enriched Studies (MaCES) Magnet	2,426,750	2,244,786	181,964	18,895
	Amount Paid by PermaCity				(64,192)
	TOTAL	20,904,121	18,243,375	2,660,746	\$ 362,346

Tesla

The District and Tesla entered into a settlement agreement on June 3, 2024, which Tesla agreed to make payments to the District under its existing obligations in the Performance Guarantee Agreements. These guaranteed payments total \$1,872,078, representing the total calculated amount of \$1,964,684, less \$92,606 previously paid by Tesla for true-up periods ending on or before September 24, 2023. We found that Tesla remitted the remaining guaranteed payments to the District as separate checks, totaling \$1,872,078, with each check corresponding to a specific

¹² SunPower and the District did not enter into a performance guarantee agreement. Therefore, no production shortfalls were noted.

site and true-up period. Not within the settlements were seven remaining sites, for which we reviewed and determined that the total underproduction was 1,009,718 kWh. This resulted in an outstanding guaranteed payment balance of \$181,692 due to the District. The table below shows the guaranteed production and actual production with the amount due to the District.

	School/Site	Guaranteed Production	Actual Production	Under Production	Amount Due to District
1	Balboa Elementary Gifted/Highly Gifted/High Ability Magnet	375,330	211,608	163,722	\$ 32,143
2	Dr Sammy Lee Elementary Medical and Health Science Magnet	228,413	187,353	41,060	3,783
3	Florence Griffith Joyner Elementary	923,844	574,791	349,053	62,569
4	Maintenance & Operations North 1428	498,150	428,399	69,751	13,373
5	Maintenance & Operations Central 1393	1,434,281	1,118,552	315,729	60,468
6	Sun Valley Magnet: Engineering Technology	861,791	823,319	38,472	8,339
7	Michelle Obama Elementary School	464,390	432,459	31,931	1,017
	Amount Paid by Tesla				-
	TOTAL	4,786,199	3,776,481	1,009,718	\$ 181,692

Engie

A review of 16 PV sites under Engie’s performance guarantees showed that total actual production (81.56 million kWh) slightly exceeded the guaranteed amount (80.24 million kWh). Although most sites surpassed their guaranteed energy production, Engie still owed monies to the District because the calculation for underproduction is based on the true-up periods. As a result, Engie owes the District approximately \$283,152 in guaranteed payments. Of this total, Engie remitted \$211,076, leaving a remaining balance of \$72,076.

	School/Site	Guaranteed Production	Actual Production	Under (Over) Production	Amount Due
1	Grover Cleveland Charter HS	1,423,424	1,736,080	(312,656)	\$ -
2	Ulysses S Grant Senior High	1,624,348	1,702,849	(78,501)	2,079
3	San Fernando MS	5,184,360	5,236,874	(52,514)	6,860
4	William Howard Taft Charter HS	6,120,805	6,650,153	(529,348)	-
5	Venice SH	2,393,427	2,595,808	(202,381)	-

	School/Site	Guaranteed Production	Actual Production	Under (Over) Production	Amount Due
6	George Washington Preparatory Senior High STEAM Magnet	3,527,994	3,910,603	(382,609)	-
7	Westchester Enriched Sciences Magnets	9,644,989	9,997,866	(352,877)	-
8	East Valley SH (EVHS #1B)	3,277,885	3,849,545	(571,660)	-
9	Roy Romer Middle School (EVMS #1)	2,799,800	2,581,004	218,796	24,937
10	San Fernando SH	6,464,444	6,532,178	(67,734)	5,433
11	San Pedro SH – Olguin Campus - SRHS#15	9,934,621	10,308,957	(374,336)	-
12	Sylmar Leadership Academy VR Span K-8 #1	3,983,694	3,961,586	22,108	7,556
13	Cesar A. Chavez LA (VRHS #5)	5,637,384	5,151,433	485,951	108,180
14	Fulton College Prep SH (VRHS #9)	4,949,078	4,975,200	(26,122)	6,905
15	Porter Ranch Community School (VR Span K-8 #2)	3,483,649	3,738,346	(254,697)	-
16	East Valley Center Middle School	9,790,909	8,627,740	1,163,169	121,202
	Amount Paid by Engie				(211,076)
	TOTAL	80,240,811	81,556,222	(1,315,411)	\$ 72,076

Hanwha

A review of six Hanwha-installed PV systems identified instances of both overproduction and underproduction relative to the guaranteed energy levels. Across all sites, the net underproduction resulted in a total amount due to the District of \$128,666. Hanwha has fully settled this amount, resolving the District’s claim related to performance guarantee shortfalls for these sites.

	School/Site	Guaranteed Production	Actual Production	Under (Over) Production	Amount Due
1	Rivera Learning Complex/SRHS #2 ¹³	3,710,618	2,502,104	1,208,514	\$ 157,839
2	Rancho Dominguez Prep - SRHS #4	1,820,750	1,907,030	(86,280)	(30,835)
3	Lawson Academy ES/SRES #11	1,522,445	1,530,176	(7,731)	(7,142)

¹³ For Rivera Learning Complex/SRHS #2, Rancho Dominguez Prep - SRHS #4, Lawson Academy ES/SRES #11, SRES #12 Moore Sci & Tech Academy, and Gardena HS, true-up reports were not provided. As such, our calculation was based only on the information provided.

4	Moore Sci & Tech Academy SRES #12	1,558,632	1,465,162	93,470	(1,898)
5	Gardena HS	2,975,101	2,832,975	142,126	8,800
6	Camino Nuevo Academy CRES#14 ¹⁴	176,972	161,910	15,062	1,902
	Amount Settled with Hanwha				(128,666)
	TOTAL	11,764,518	10,399,357	1,365,161	\$ -

However, the District has not yet received the eight required true-up reports from Hanwha. These outstanding reports include the Term 4 reports for Rivera Learning Complex/SRHS #2, Rancho Dominguez Prep - SRHS #4, Gardena HS, Lawson Academy ES/SRES #11, and Moore Sci & Tech Academy SRES #12, as well as the Term 2 through Term 4 reports for Camino Nuevo Academy CRES #14. Unlike other contractors, Hanwha’s DAS is not functioning, which does not allow the District to independently access production data. ESO stated that Hanwha sends production information monthly. However, without the required true-up reports and complete actual production data, the OIG is unable to calculate or verify whether guarantee payments are owed. Consequently, any amounts due to the District from Hanwha cannot be determined at this time. See Finding No. 5 and its corresponding recommendations regarding the failure to remit required true-up reports.

The problem occurred primarily because the District lacked sufficient personnel within the ESO to adequately monitor system performance, track true-up periods, and follow up on contractor obligations. Staffing limitations resulted in inconsistent review of production data, delayed identification of under-performing systems, and insufficient follow-up to ensure contractors issued required guarantee payments. As a result, outstanding true-up amounts were neither pursued nor collected in a timely manner.

Recommendation 3.1 – ESO should seek reimbursement from the respective contractors for the estimated **\$616,114** underpaid guarantee payment amount.

ESO’s Response – ESO agrees with the finding and recommendation and indicated that it will request the delinquent true-up reports from the solar vendors and determine the appropriate guaranteed payment based on actual production and the applicable weather adjustment factor. ESO further stated that they will collect shortfall payments from the contractor if the PV system has underperformed. ESO further indicated that they will make the request for delinquent true-up reports by July 1, 2026, and explained that the full-time analysis and support are dependent on approval of the vacant Energy Specialist and Senior Energy Specialist positions.

Recommendation 3.2 – ESO should assign specific staff within the ESO to oversee performance guarantee compliance, including the review of true-up reports, calculation of the Accrual/Payment for each true-up period, which includes a weather adjustment factor (i.e., SEAMC/SETMC), verification of contractor calculations, and tracking of payments

¹⁴ For CRES#14 Camino Nuevo Academy, only one reporting period was provided. There were three reporting period for which no true-up payments were provided. As such, our calculation was based only on the information provided.

owed or received. Specifically, the ESO should establish and enforce standardized monthly procedures for evaluating actual production data against guaranteed performance thresholds. These procedures must include clearly defined timelines, designated responsible personnel, and comprehensive documentation protocols to ensure consistency and accountability.

ESO's Response – ESO agrees with the finding and recommendation and indicated that assigning staff to oversee performance guarantee compliance is dependent on the approval of the vacant Energy Specialist and Senior Energy Specialist positions, and if approved by the Personnel Commission, implementation of corrective actions will occur within six months from approval.

Finding No. 4 – The ESO is not Actively Monitoring the Guaranteed Energy Production

The ESO is not actively monitoring or following up with PV contractors regarding guaranteed payment exceptions under the performance guarantee agreements. The ESO does not have a formal or consistent process in place to review energy production data, validate true-up reports, or pursue compensation when production deficiencies occur. Follow-up with contractors is limited, and documentation of contractor correspondence or reconciliations is often incomplete or absent. Consequently, variances between expected and actual production are not being analyzed or resolved, and the District may be forgoing potential payments that it is contractually entitled to receive. As a result, the District has not received compensation for underperformance, leading to a financial shortfall and raising concerns about contract enforcement and contractor accountability. The lack of systematic oversight limits management's ability to assess contractor performance, enforce accountability, and verify that the District's investment in solar infrastructure is yielding the anticipated financial and energy-efficiency benefits. Strengthening monitoring and follow-up procedures would help ensure compliance with contractual obligations and safeguard the District's financial interests.

Recommendation 4.1 – The ESO should establish a formal monitoring process by developing and implementing a standardized monitoring protocol to routinely review actual energy production against contractual guarantees. This should include periodic data collection from contractor monitoring portals and validation of true-up reports and production figures.

ESO's Response – ESO agrees with the finding and recommendation and stated that it is working with a consultant to develop and implement a centralized, cloud-based reporting and monitoring system. The system will be capable of collecting real-time production data, analyzing and comparing historical production and savings against baseline data, and generating automated alerts when systems are not producing or are underperforming. This system will enable ESO and the M&O Technical Unit to promptly investigate and address issues. Additionally, the system will incorporate weather-adjustment factors to improve the accuracy and reliability of overall performance analysis.

ESO stated that it will implement a centralized monitoring system by October 1, 2026, and explained that support and monitoring will commence six months following the Personnel

Commission's approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

Recommendation 4.2 – Create a centralized database or dashboard to record and monitor key PV performance data (e.g., expected vs. actual kWh production, shortfalls, and corresponding payment obligations). The system should also maintain documentation of contractor communications, payment confirmations, and reconciliation activities.

ESO's Response – ESO agrees with the finding and recommendation and stated that it is working with a consultant to develop and implement a centralized, cloud-based reporting and monitoring system. The system will be capable of collecting real-time production data, analyzing and comparing historical production and savings against baseline data, and generating automated alerts when systems are not producing or are underperforming. The system will enable ESO and the M&O Technical Unit to promptly investigate and address issues. Additionally, the system will incorporate weather-adjustment factors to improve the accuracy and reliability of overall performance analysis.

ESO stated that it will implement a centralized monitoring system by October 1, 2026, and explained that support and monitoring will commence six months following the Personnel Commission's approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

III. The Contractors Did Not Provide True-Up Reports on Time

According to the Guaranteed Performance Agreement, true-up reports are to be provided to the District, typically within 30 days following the end of each true-up period. The contractors are to provide the District with a report detailing each system's actual generation in comparison with the associated expected energy generation and with the performance guarantee. The true-up period typically spans 2.5 years for each site, and the reports are essential for verifying whether actual energy production met the guaranteed 95% threshold and for determining whether compensation is owed to the District for underperformance.

Finding No. 5: Delayed and Missing Submission of True-up Reports

We requested the true-up reports from ESO for each contractor associated with the various solar project sites; however, the reports were not readily available at the time of our request. According to ESO, some true-up reports were not provided by the contractors. Following the commencement of our review, ESO began contacting the respective contractors to obtain the true-up reports, which were subsequently provided after our inquiry. For the period under review, we received 16 out of 41 reports. Below is a summary of the reports received.

Contractor	No. of Sites with True-up Reports Due	No. of True-up Reports Due as of 06/30/2025	No. of True-up Reports Received	No. of True-up Reports Outstanding
Tesla (SolarCity)	7	7	0	7
Engie	16	16	16	0
PermaCity	5	10	0	10
Hanwha	6	8	0	8
Total	34	41	16	25

Our review revealed significant issues with the timeliness of report submissions. Engie submitted all 16 required reports, however, each was submitted after its respective deadline. Hanwha did not submit any reports. PermaCity failed to submit any of the 10 reports due for Terms 1 through 4. Tesla had multiple reports due, none of which were received as of the review date, and all are considered overdue.

The delays appear to stem from the absence of a formal reporting calendar and follow-up mechanism within the ESO. According to ESO, they did not have a dedicated person to follow-up on the submittal of these reports. Without a structured process to track due dates, monitor submissions, and follow up on delinquencies, contractors have not consistently met their reporting obligations. This lack of oversight impairs the District’s ability to verify contractor compliance and delays the identification and recovery of compensation for underproduction, potentially resulting in financial losses and weakened management visibility.

Recommendation 5 - ESO should manage and monitor all contractor true-up reports and implement a centralized tracking system that records due dates and receipt statuses. The ESO should also proactively request missing reports when due and perform follow-up procedures to ensure the timely submission of the true-up reports.

ESO’s Response – ESO agrees with the finding and recommendation and indicated that it will request delinquent true-up reports from solar vendors by July 1, 2026 to evaluate guaranteed performance based on actual system production and applicable weather-adjustment factors. Where performance falls below guaranteed levels, ESO will calculate and pursue collection of shortfall payments in accordance with contract terms. Furthermore, ESO will implement a centralized monitoring system by October 1, 2026, and explained that support and monitoring will commence six months following the Personnel Commission’s approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

Finding No. 6 – No Review of the Energy Production through Web-Based DAS

During our discussions with ESO, we reviewed the process used to track and verify actual energy production data reported by the solar contractors. ESO explained that contractors provided the District with login credentials to access their independent energy web-based data DAS, which captures and displays real-time production data directly from the installed solar panels. These

systems are designed to enable transparent and independent oversight of solar performance by allowing authorized users to review, compare, and validate actual production against expected output levels.

However, our review found that the independent review of energy production data had not been performed for an extended period. Although the systems remained functional, ESO staff had not been logging into the platforms to review or verify the data. Additionally, there was no process in place to routinely identify declines in production or investigate potential causes. No one was assigned to determine why a reduction in energy output occurred or to coordinate with M&O staff to inspect affected systems. Consequently, some solar units experienced periods of malfunction or complete shutdown, resulting in lapses where no energy was being generated.

Based on our discussions with ESO Management, the primary reason for the lack of active monitoring was the absence of designated personnel responsible for overseeing the review and verification of energy production data. ESO does not currently have staff assigned to regularly log into the monitoring systems, track production trends, or follow up on variances in energy performance.

Without dedicated oversight, energy production anomalies and system malfunctions may go unnoticed for extended periods. This lack of monitoring prevents timely identification of underperforming systems, potentially resulting in prolonged energy losses, reduced cost savings, and inaccurate assessments of contractual performance guarantees. Furthermore, the absence of a systematic review process limits the ESO's ability to ensure that contractors are meeting expected energy output levels, which could lead to errors in guaranteed payment calculations and hinder effective management of solar energy assets.

Recommendation 6.1 – ESO should establish written procedures outlining the frequency and scope of monitoring activities, including thresholds for identifying performance variances and protocols for notifying M&O staff when energy output decreases.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it would develop these parameters and incorporate them into the centralized reporting and monitoring system. ESO stated that it will implement a centralized monitoring system by October 1, 2026, and explained that support and monitoring will commence six months following the Personnel Commission's approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

Recommendation 6.2 – ESO should assign dedicated personnel responsible for routinely monitor and verify energy production data from each contractor's independent tracking system.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it will develop a schedule to spot check and compare data collected by the centralized system against the solar contractors' web-based data acquisition systems by October 1, 2026, and explained that support and monitoring will commence six months following the Personnel

Commission's approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

Recommendation 6.3 – ESO Management should implement periodic reviews to confirm that energy monitoring activities are being performed consistently and that system issues are addressed promptly to maintain optimal energy generation across all solar sites.

ESO's Response – ESO agrees with the finding and recommendation and indicated that it will set parameters in the centralized system to send alarms if production falls below certain predetermined levels by October 1, 2026, and explained that support and monitoring will commence six months following the Personnel Commission's approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

IV. The Contractor Did Not Provide Operation and Maintenance Services as Required by the Contracts

According to the Solar PV System Panel Washing Process and Procedures Guideline 2022 v.5, under the District's current O&M and performance guarantee contracts, each solar contractor is responsible for conducting PV panel washing to enhance the efficiency and output of solar energy production. The panel washing process requires significant coordination among the Construction Project Manager (CPM), school site personnel, and the contractors performing the cleaning services. At the start of each year, the ESO is supposed to collaborate with each solar contractor to obtain projected panel cleaning schedules. These proposed dates are reviewed with the respective Plant Managers, adjusted as necessary, and finalized in an online master schedule. Once confirmed, the schedules are communicated to both the Plant Managers and CPMs, and the supporting documentation is uploaded and maintained as part of the official project record for ongoing reference.

To set up O&M services, ESO staff contact the contractors and Plant Managers directly to confirm daily schedules and subsequently inform the assigned CPMs, an approach adopted to ensure efficiency given the high turnover among CPM staff. To minimize scheduling conflicts, all coordination is conducted via group email threads that include the contractor, Plant Manager, and CPM. Under the District's current O&M and performance guarantee agreement, each solar contractor is responsible for conducting PV panel washing annually to enhance the efficiency and output of solar energy production. The District had paid \$7,736,684 to five contractors for O&M services. Below is a summary of the total cost paid to each contractor.

Contractors	Contract Term	Total Value	Annual Cost of PM
Tesla	20 years	\$ 2,708,366	\$ 135,418
Engie	20 years	3,551,992	177,600
Hanwha	20 years	363,710	18,186
PermaCity	20 years	1,112,616	55,630
SunPower ¹⁵	10 years	-	-
Total		\$ 7,736,684	\$ 386,834

These O&M agreements required the contractors to provide ongoing system services intended to ensure that the PV systems operated efficiently and achieved expected energy performance levels. The scope of these services generally included PM (inspections and other system checks to identify and correct issues that could impair solar energy production) and PW activities.

Upon review, we found that while all contractors were contractually obligated to provide O&M services, the specific terms and detailed requirements varied among the agreements. For instance, the frequency and scope of PM, the schedule for PW, and the reporting requirements differed from one contractor to another. Some contracts included explicit timelines and performance standards for maintenance and cleaning, whereas others provided only general descriptions without measurable benchmarks. These inconsistencies may result in varying levels of oversight and system performance across the District’s portfolio of solar installations.

In addition, according to the ESO, responsibility for the O&M portion of the work was transferred to M&O in March 2024. Prior to this transition, ESO was responsible for the maintenance and monitoring of the PV systems, including coordinating with contractors to ensure compliance with the O&M terms. The transfer of duties was part of a broader realignment of responsibilities intended to consolidate oversight and streamline the management of ongoing maintenance activities under M&O. However, at the time of the transition, ESO staff indicated that the monitoring functions and coordination with the contractors were still being finalized, and some documentation of maintenance schedules and service verification was incomplete or inconsistent.

The table below provides a summary of the O&M agreement provisions for each contractor, including the frequency and scope of PM and PW services, along with other terms that govern the District’s expectations for ongoing system performance and contractor accountability. Below is a summary of the required PM and PW services for each contractor.

¹⁵ The O&M service for SunPower expired on June 30, 2020. In addition, SunPower’s cost of O&M services was included in the lump sum cost for the PV installation.

Contractor	Contracts	Term of O&M Agreement(s) (Years)	Frequency of PM Service	Frequency of PW Service
Tesla	1180017 1290019 1290094 1490014	20	Twice a year	As frequently as needed for the first 10 years and once a year for the second 10 years
Engie	1180016 1290017	20	Once a year	Once a year
Hanwha	1290018	20	Twice a year	As frequently as needed for the first 10 years and once a year for the second 10 years
PermaCity	1180019 1290016	20	Twice a year	Once a year
SunPower	0980028	10	Once a year	Not specified

Finding No. 7 – No Oversight of Preventive Maintenance

During the review period, contractors responsible for solar operations and maintenance failed to meet their contractual obligations for PM services. Based on service agreements and site counts, a total of 94 PM services were required annually across five contractors. From July 1, 2020, through June 30, 2025, the PV Program required 470 PM services; however, only 12 were completed, resulting in an overall compliance rate of 2.55%. Below is a summary of the PM services for each contractor.

Contractor	Sites	PM Frequency	Required PM Services - Annually	Required PM Services From 7/1/2020 - 6/30/2025	Completed PM Services	Compliance Rate
Tesla	28	2/year	56	280	0	0.00%
Engie	16	1/year	16	80	6	7.50%
Hanwha	6	2/year	12	60	0	0.00%
PermaCity	5	2/year	10	50	6	12.00%
Total	55		94	470	12	2.55%

Two major contractors, Tesla and Hanwha, failed to perform any PM services despite being responsible for a combined 340 required services, yielding 0% compliance. Engie, responsible for 80 required services, completed only six (7.50% compliance). PermaCity also completed only 6 out of 50 required services (12.00% compliance). The data reflects a breakdown in contractor performance, with all vendors falling short of contractual obligations. The near-zero completion rates indicate inadequate contractor engagement and insufficient oversight to detect or correct non-

performance. As a result, the District faces increased risks related to system downtime, reduced energy production, and potential equipment degradation.

According to ESO, they lack sufficient personnel to actively oversee contractor performance, monitor scheduled PM activities, and verify completed work. As such, preventative maintenance obligations went unfulfilled. The absence of adequate staffing prevented ESO from conducting timely follow-up, validating contractor submissions, or ensuring accountability for missed services.

Recommendation 7 – ESO and M&O Management should develop a centralized tracking and verification system within Maximo (or an equivalent maintenance management platform) to document the performance of all PM O&M activities related to preventative maintenance.

The system should:

- **Track Site-Level Activities:** Identify and record the specific school sites where preventative maintenance and panel washing have been completed, including the date of service, the contractor responsible, and verification by District personnel.
- **Require Documentation Uploads:** Mandate that contractors and M&O staff upload supporting documentation (e.g., service logs, inspection reports, photos, or contractor certifications) as evidence of completed maintenance activities.
- **Enhance Coordination Between ESO and M&O:** Formalize the transition of responsibilities from ESO to M&O through a memorandum or procedural guideline clarifying roles, data ownership, and reporting responsibilities to ensure continuity and accountability.

ESO's Response - ESO agrees with the finding and recommendation and indicated that the M&O Technical Unit will take the lead in scheduling and monitoring the annual panel washings and annual preventative maintenance services. M&O Technical Unit will also utilize Maximo to track all service calls and work orders, and implement a tracking spreadsheet for these service calls and work orders by November 1, 2026. Furthermore, ESO will assist with document review and contractual support, and explained that support and monitoring will commence six months following the Personnel Commission's approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

Finding No. 8 – Panel Washing Services Not Provided as Scheduled

Based on contractual obligations and the number of active solar sites, each contracted site is required to receive one annual panel wash; with a total of 55 contracted sites, this equates to 55 PW services each year. The breakdown of these 55 PW services by contractor is as follows:

Contractor	Contracted Sites	Washing Frequency	Required PW Services - Annually
Tesla	28	1 per year	28
Engie	16	1 per year	16
Hanwha	6	1 per year	6
PermaCity	5	1 per year	5
Total	55		55

From July 1, 2020, through June 30, 2025, the PV Program required 275 PW services, or 55 PW services annually for five years. However, we were only able to verify 17 PW services provided, resulting in an overall compliance rate of 6.18%.

Fiscal Year	Required PW Services - Annually	PW Services Completed ¹⁶	Compliance %
2021	55	0	0.00%
2022	55	11	20.00%
2023	55	6	10.91%
2024	55	0	0.00%
2025	55	0	0.00%
Total	275	17	6.18%

Recommendation 8.1: ESO should remind the contractors to submit updated service plans that clearly outline how they will recover missed washes and maintain compliance moving forward.

ESO’s Response - ESO agrees with the recommendation and indicated that it will schedule meetings with each solar vendor to address outstanding issues by July 1, 2026. Furthermore, at these meetings, ESO will discuss delinquent true-up reports, PV systems that are not producing or reporting, and any missed annual PM or PW services. ESO will also provide solar vendors with the option to either (1) extend PM and PW services beyond the 20-year O&M agreement to compensate for missed services, or (2) reimburse the LAUSD for the value of services not performed. ESO further explained that support and monitoring will commence six months following the Personnel Commission’s approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

¹⁶ For the 11 PW services completed in Fiscal Year 2022, seven were completed by Engie, and four were completed by PermaCity. For the six PW services completed in Fiscal Year 2023, one was completed by PermaCity, and five were completed by Hanwha.

Recommendation 8.2: ESO should develop a centralized tracking system to monitor service delivery in real time. This system should include automated alerts for overdue services, digital logs for completed work, and reporting capabilities to support periodic audits.

ESO’s Response - ESO agrees with the finding and recommendation and stated that it is working with a consultant to develop and implement a centralized, cloud-based reporting and monitoring system. The system will be capable of collecting real-time production data, analyzing and comparing historical production and savings against baseline data, and generating automated alerts when systems are not producing or are underperforming. This system will enable ESO and the M&O Technical Unit to promptly investigate and address issues. Additionally, the system will incorporate weather-adjustment factors to improve the accuracy and reliability of overall performance analysis.

ESO stated that it will implement a centralized monitoring system by October 1, 2026, and explained that support and monitoring will commence six months following the Personnel Commission’s approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

Recommendation 8.3: ESO should prioritize site inspections for locations that have gone multiple years without documented panel washing and determine whether performance degradation and equipment damage are due to a lack of cleaning by October 1, 2026.

ESO’s Response - ESO agrees with the finding and recommendation and indicated that through the centralized monitoring system, it will prioritize those sites with missed panel washing, compare actual production data against guaranteed production, and take appropriate action by October 1, 2026. ESO explained that support and monitoring will commence six months following the Personnel Commission’s approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

From July 1, 2020, through June 30, 2025, contractors are required to perform a combined total of 745 PM and PW services, consisting of 470 PM services and 275 PW services. Tesla accounts for the largest share of responsibilities, representing 56% of the total required services, reflecting the size and value of its installations. The table below shows the required O&M activities for each contractor.

Contractors	Total Paid by the District	Annual Cost of O&M	Required PM Services	Required PW Services	Total Service
Engie	\$ 3,551,992	\$ 177,600	80	80	160
Tesla	\$ 2,708,366	\$ 135,418	280	140	420
PermaCity	\$ 1,112,616	\$ 55,630	50	25	75
Hanwha	\$ 363,710	\$ 18,186	60	30	90
Total	\$ 7,736,684	\$ 386,834	470	275	745

A review of contractor-provided O&M services from July 1, 2020, through June 30, 2025 revealed significant gaps between required services and actual services rendered. Across all four

contractors, only 29 of 745 required services were performed, representing a completion rate of 3.89%. On an annual basis, the value of O&M services not rendered total to \$363,235 and over the five-year review period, this equates to **\$1,816,174**. Engie represents the largest portion of this amount (\$815,848) in unused services over five years, followed by Tesla (\$677,902), PermaCity (\$237,358), and Hanwha (\$85,876).

Contractors	Annual Cost of O&M	Total Service	Total Service Completed	% Of Service Completed	Questionable Service Per Year	Questionable Service (5-Year Period)
Engie	\$ 177,600	160	13	8.13%	\$ 163,170	\$ 815,848
Tesla	\$ 135,418	420	0	0.00%	\$ 135,418	\$ 677,092
PermaCity	\$ 55,630	75	11	14.67%	\$ 47,472	\$ 237,358
Hanwha	\$ 18,186	90	5	5.56%	\$ 17,175	\$ 85,876
Total	\$ 386,834	745	29	3.89%	\$ 363,235	\$ 1,816,174

Recommendation 8.4 – ESO should recover \$1,816,174 of O&M activities that were not rendered by the contractors.

ESO’s Response - ESO agrees with the finding and recommendation and indicated that it will schedule meetings with each solar vendor to address outstanding issues by July 1, 2026. Furthermore, at these meetings, ESO will discuss delinquent true-up reports, PV systems that are not producing or reporting, and any missed annual PM or PW services. ESO will also provide solar vendors with the option to either (1) extend PM and PW services beyond the 20-year O&M agreement to compensate for missed services, or (2) reimburse the LAUSD for the value of services not performed. ESO further explained that support and monitoring will commence six months following the Personnel Commission’s approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

V. The Recommendations and Agreed Upon Actions from the February 18, 2021 Performance Audit were Not Implemented

The OIG previously conducted a contract audit and issued [Report No. CA 20-1269](#), dated February 18, 2021, titled “*District’s Photovoltaic Program (PV Program)*.”

The audit objectives were to:

1. Assess whether the actual PV system production during the first three years of operation met the production estimates established by the FSD at the program’s outset.
2. Determine whether contractors complied with the performance guarantee requirements outlined in their agreements with the District.
3. Verify whether contractors provided the operation and maintenance services required under their contracts.

In addition, the OIG evaluated whether the PV Program generated a financial benefit for the District. The audit scope covered the period from the PV Program's inception through **June 30, 2020**. The OIG issued **12 recommendations**, all of which were accepted by the FSD.¹⁷

Finding No. 9 – Failure to Implement Prior Audit Recommendations

We conducted a follow-up review of the recommendations made and determined that 6 out of 12 recommendations were not implemented, two recommendations were partially implemented, and four were implemented. For additional information, see Appendix I.

According to the ESO, they have not yet implemented the recommendations from the previous performance audit, citing staffing limitations due to the lack of allocation of funding as a key barrier. As such, we recommend the following:

Recommendation 9.1 – ESO should assess all 12 prior recommendations, prioritize those with the greatest impact on compliance, cost savings, and program effectiveness, and establish clear and achievable implementation timelines with interim milestones to ensure sustained progress.

ESO's Response - ESO agrees with the finding and recommendation and stated that it has reviewed the prior recommendations and cross-referenced them against the current, similar recommendations to combine as one task for prioritization and tracking. ESO indicated that this implementation will be ongoing and explained that support and monitoring will commence six months following the Personnel Commission's approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

Recommendation 9.2 – ESO should implement a monitoring and reporting mechanism to track the status of each outstanding recommendation, provide regular progress updates (e.g., quarterly) to ESO Management, and conduct periodic internal reviews to evaluate the effectiveness of newly implemented procedures and adjust as needed.

ESO's Response - ESO agrees with the finding and recommendation and indicated that it will regularly assess and review the effectiveness of renewed procedures and efforts to address all open recommendations. ESO indicated that this implementation will be ongoing and further explained that support and monitoring will commence six months following the Personnel Commission's approval to fill the vacant Energy Specialist and Senior Energy Specialist positions.

¹⁷ In 2023, the Board appointed the Chief Eco-Sustainability Officer and established the Eco-Sustainability Office (ESO).

CONCLUSION

The OIG identified significant gaps in the oversight, monitoring, and enforcement of the District's solar PV performance guarantee and O&M agreements. While the District entered into comprehensive contracts with five major solar contractors, Tesla, Engie, Hanwha, PermaCity, and SunPower, to ensure long-term energy performance and sustainability benefits, the implementation and follow-up processes have been inconsistent and insufficiently controlled.

Summary of Key Findings:

Noncompliance with Performance Guarantee Agreements – Several contractors did not meet the guaranteed annual energy production thresholds as specified in their agreements. Although contractual provisions allow for certain adjustments due to factors such as shading, equipment malfunction, or environmental conditions, documentation supporting these adjustments was often incomplete or delayed. As a result, the OIG calculated **\$616,114** in guaranteed payments owed to the District.

Lack of Active Monitoring and Oversight – ESO has not maintained a formal, structured process to routinely monitor energy production, validate true-up reports, or follow up on production variances. Without designated personnel or a centralized monitoring system, the District lacks assurance that underperformance is promptly detected, investigated, and resolved. Consequently, the District may be foregoing financial recoveries and missing opportunities to enforce contractor accountability.

Insufficient Energy Production Tracking – Actual PV system output has consistently fallen below District projections. Over the years, systemwide production averaged approximately 72% of the expected energy generation. Inadequate tracking of downtime events, delayed system repairs, and a lack of verification for contractor-proposed adjustments further contributed to the underperformance of several installations.

Delayed and Incomplete True-Up Reports – Contractors frequently failed to submit true-up reports within the required timeframe, limiting ESO's ability to independently verify compliance with performance guarantee provisions. The absence of a centralized repository or assigned staff to track report submissions has hindered effective oversight.

No Independent Review of Contractor Data Systems – Although contractors granted ESO access to independent DAS systems for real-time production monitoring, ESO staff had not been logging in or reviewing these systems regularly. The absence of independent verification increases the risk that performance discrepancies remain undetected and unaddressed for extended periods.

Inadequate Oversight of O&M Activities – The review found that preventive maintenance and panel washing activities were not consistently tracked or verified. Documentation confirming whether required O&M services were performed was incomplete or missing, and maintenance records within Maximo were not updated to reflect completed work. These deficiencies may reduce energy efficiency, increase long-term maintenance costs, and expose the District to noncompliance with contractual obligations. The OIG calculated and determined that \$363,235 in O&M services were not rendered on an annual basis, and over the five-year review period, this equates to **\$1,816,174** of O&M services for which the District paid, but did not receive.

Prior Audit Recommendations Not Fully Implemented – Of the 12 recommendations issued by the OIG in its 2021 audit of the District’s Photovoltaic Program, four were fully implemented. Six recommendations remain unimplemented, and two were only partially implemented, primarily due to staffing limitations and lack of dedicated funding. This continued inaction perpetuates the same weaknesses previously identified and limits the District’s ability to ensure the PV Program’s intended cost savings and operational benefits.

The District’s PV Program was designed to achieve both financial and environmental benefits through renewable energy production and long-term sustainability. However, the current oversight structure lacks the necessary internal controls, data management, and accountability mechanisms to ensure the program’s effectiveness. Weaknesses in monitoring, documentation, and enforcement of contract terms have resulted in lost opportunities for recovery, inefficiencies in maintenance, and reduced system performance. By addressing these deficiencies and implementing consistent monitoring and reporting practices, the District can enhance its oversight capacity, enforce contractor accountability, and ensure that its renewable energy assets achieve their intended operational and financial outcomes.

SUMMARY OF REVIEW PROCEDURES

The OIG performed the following steps to review the PV Program:

- A. Obtained the contractors' true-up reports and supporting documents, and performed the following:
 - i. Verified the actual production through the web-based data acquisition systems.
 - ii. Recalculated the accrual/payment for each guaranteed year and compared it to the contractor's calculation.
 - iii. Traced the cancelled check to the correct district department to validate receipt.
- B. Discussed with the ESO to obtain an understanding of the operation and maintenance services.
- C. Requested the Operation and Maintenance Report from M&O.
- D. Obtained and reviewed the operations and maintenance services reports to determine if the contractor's service meets the contract terms and conditions.
- E. Questioned the operation and maintenance costs if the contractor cannot provide evidence of preventive maintenance and panel washing services.
- F. Obtained the actual PV system production information.
- G. Evaluated the above test work and determined if the recommendations and responses from the prior audit have been adequately addressed.

SPECIAL REVIEW TEAM

Amy Long, Assistant Inspector General
Kien Hong, Forensic and Support Services Manager
Valerie Logan, Principal Auditor

APPENDIX I – STATUS OF PRIOR YEAR AUDIT

The OIG previously conducted a contract audit and issued [Report No. CA 20-1269](#) on February 18, 2021, titled “District’s Photovoltaic Program (PV Program).” The objectives of the audit were to: (i) determine whether the actual PV system production for the first three years of operation met the estimated production by the FSD at the beginning of the PV Program; (ii) determine whether the contractors complied with the requirements specified in the performance guarantee agreements between the District and the contractors; and (iii) determine whether the contractors provided operation and maintenance services as required by the contracts. In addition to the above audit objectives, the OIG also performed an analysis on whether there is a financial benefit for the District from the PV Program. The audit covered the period from the inception (2009) of the PV Program through June 30, 2020.

The OIG issued a total of 12 recommendations, all of which were agreed to by the FSD. However, our follow-up review determined that six of the 12 recommendations had not been implemented, two were partially implemented, and four were fully implemented. The table below summarizes the prior-year recommendations, management’s responses, and their current implementation status.

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	OIG Recommendations	EMU’s or Contractor's Response	Current Status
I-1	We recommend that EMU strengthen its monitoring procedures with regard to the agreements and ensure that the contractors complete the required services. We also recommend that EMU review the PM reports, follow up with the issues identified in the reports to ensure the contractors’ compliance with the contract requirements, and improve the performance of the PV systems.	EMU agreed with the recommendation and requested additional resources to help manage the PV Program, including reviewing reports and following up with issues that will help improve PV system performance.	Not implemented – The ESO’s Senior Project Manager reported that the Sustainability Office has not yet implemented the recommendations from the prior audit and explained that the office is actively developing comprehensive procedures to strengthen the documentation, tracking, and reporting of energy generation monitoring and preventive maintenance activities tied to existing photovoltaic contracts. These efforts are part of a broader initiative to improve operational transparency and to ensure long-term contract compliance.
I-2	We recommend that EMU should continue working with OGC and the two contractors to ensure the District will be compensated, either by getting new systems or extending the performance guarantee and operation and maintenance service terms, for the loss of the disconnected and terminated PV systems. We also recommend that FSD closely	EMU agreed with the recommendation and is in the process of developing an inclusive database system to help monitor the PV Program sites and activities impacting performance. EMU requested additional resources to help with this effort.	Partially Implemented - The ESO’s Senior Project Manager stated that the current status of the outstanding payments is as follows: <ol style="list-style-type: none"> 1. Tesla has paid the outstanding amount due through April 9, 2024, totaling \$1,872,078. 2. Engie paid the \$15,540 in full. 3. The Hanwha balance of \$69,661 was settled with the District.

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	<p>monitor modernization and other construction activities on PV sites, evaluate any impact of those activities, and take remedial actions to recover any potential loss. We also recommend that EMU review the PM reports, follow up with the issues identified in the reports to ensure the contractors' compliance with the contract requirements and improve the performance of the PV systems.</p>		<p>4. PermaCity balance of \$64,192 was paid to the District.</p> <p>Although the amount was paid by the contractors, ESO did not develop an inclusive database system to help monitor the PV Program sites and activities impacting performance.</p>
<p>II.1</p>	<p>We recommend that EMU should enforce the contract requirement related to true-up reporting and establish procedures to monitor the contractors' compliance with this requirement.</p>	<p>EMU agreed with the recommendation and would dedicate staff resources to monitor the contractors' compliance with contract requirements.</p>	<p>Not Implemented – The ESO's Senior Project Manager confirmed that the Sustainability Office has not yet implemented the recommendations identified in the prior audit. They noted that the office is currently developing comprehensive procedures to enhance the documentation, tracking, and reporting of ongoing energy generation monitoring and preventive maintenance activities related to existing photovoltaic contracts.</p>
<p>II.B</p>	<p>We recommend that the District seek reimbursement from each contractor for their portion of the \$872,148 questioned underpaid guarantee payment amount.</p>	<p>EMU will review the true-up reports to verify the underpaid guaranteed payment and will follow up with PSD to verify and seek reimbursement for the underpaid guaranteed payments from each applicable contractor.</p>	<p>Partially Implemented - The ESO's Senior Project Manager, stated that the current status of the outstanding payments is as follows:</p> <ol style="list-style-type: none"> 1. Tesla has paid the outstanding amount due through April 9, 2024, totaling \$1,872,078. 2. Engie paid the \$15,540 in full. 3. The Hanwha balance of \$69,661 was settled with the District. 5. PermaCity balance of \$64,192 was paid to the District. <p>Although the amount was paid by the contractors, ESO did not develop an inclusive database system to help monitor the PV Program sites and activities impacting performance.</p>

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II.B	<p><u>Tesla:</u> We recommend that Tesla should work with EMU to finalize the balance of the true-up amount due to the District for the audited underpaid guaranteed payment amount of \$722,755.</p>		<p>Implemented - Tesla has settled with the District and paid the outstanding amount due through April 9, 2024, totaling \$1,869,033.</p>
II.B	<p><u>Engie:</u> We recommend that Engie make payment to the District for the underpaid guaranteed payment of \$15,540. Engie agreed with our findings and stated that it would make payment to the District for the underpaid guaranteed payment amount.</p>		<p>Implemented - Engie paid \$15,540 in full.</p>
II.B	<p><u>Hanwha:</u> We recommend that Hanwha should make a payment of \$69,661 to the District as the balance due to the underpaid performance guarantee payments. As shown in the table above, the total audited amount of guaranteed payments Hanwha owed the District was \$175,791. Of this amount the District withheld \$106,130 from Hanwha's Payment Application under contract No. 1290018 leaving a balance of \$69,661 due to the District. We also recommended that Hanwha should provide the District with true-up reports for each system no later than 30 days following the end of each true-up period.</p>	<p>In reviewing Hanwha's response to our draft audit report, we disagreed with Hanwha's efforts to combine the five solar systems in five different school sites (SRHS#2, SRHS#4, Gardena HS, SRES #11 & SRES#12) into one generation resource for calculating the Guarantee Payment. The Performance Guarantee agreement was specific to each solar system on each site. There is no indication in the Agreement that performance guarantees are to be calculated altogether.</p>	<p>Implemented - The Hanwha balance of \$69,661 was settled with the District.</p>
II.B	<p><u>PermaCity:</u> We recommend that PermaCity should make a payment of \$64,192 to the District for the underpaid performance guarantee payment and provide the District with the required true-up reports no later than</p>	<p>PermaCity agreed with the finding and will make a payment to the District for the underpaid guaranteed payment amount of \$64,192.</p>	<p>Implemented - PermaCity balance of \$64,192 was paid to the District.</p>

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	30 days following the end of each true-up period.		
II.C	<p>We recommend that EMU review the adjustments made by the contractors to the guaranteed or actual production in the true-up report to ensure that the adjustments are allowable and adequately supported in accordance with the terms and conditions of the contract.</p> <p>We also recommend that EMU work closely and proactively with schools and other departments to reduce the risk of system damage and equipment being stolen, so that the adjustment to the guaranteed performance would be minimized.</p> <p>Furthermore, EMU should reduce the repair time or system shutdown time when possible, to prevent solar energy production loss.</p>	<p>EMU agreed with the recommendation and developed a spreadsheet to monitor and reduce system downtime to prevent solar energy loss.</p>	<p>Not Implemented - ESO's Senior Project Manager, confirmed that the Sustainability Office has not yet implemented the recommendations from the previous audit, citing staffing limitations as a key barrier. The office is currently operating with four vacant positions and constrained district funding, which has significantly hindered its capacity to initiate corrective measures and fully address the audit findings.</p>
III.1	<p>We recommend that EMU strengthen its procedures with regard to monitoring the agreements and ensuring contractors' completion of the required services. We also recommend that EMU review the PM reports, follow up with issues identified in the reports to ensure the contractor's compliance with the contract requirements and improve the performance of the PV systems.</p>	<p>EMU agreed with the recommendation and stated that it would dedicate staff resources to monitor the contractors' compliance with contract requirements to improve the PV system's performance.</p>	<p>Not Implemented – The ESO has not yet implemented the recommended enhancements to its contract monitoring procedures. Specifically, the ESO has not formalized a process for conducting comprehensive reviews of preventive maintenance (PM) reports, following up on identified issues, or verifying contractor compliance with service obligations. However, the department is currently drafting new procedures to strengthen oversight and improve the overall performance of photovoltaic systems.</p>
III.2	<p>We recommend that PSD should determine the portion of the paid operation and maintenance cost that relates to required preventive maintenance services and</p>	<p>EMU agreed with the recommendation to review and determine preventative maintenance cost reimbursement owed by contractors.</p>	<p>Not Implemented – The ESO has not implemented a recommendation to determine the portion of paid operation and maintenance costs attributable to unfulfilled preventive maintenance and module wash</p>

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	<p>module wash services not provided by the contractors. We recommend that FSD should seek reimbursement for that amount from the respective contractors.</p>		<p>services. The ESO's has also not initiated reimbursement efforts with the respective contractors. According to department leadership, the lack of implementation is primarily due to ongoing budget constraints and staffing shortages, which have limited the district's capacity to conduct detailed cost analysis and pursue recovery efforts.</p>
<p>V</p>	<p>We recommend that EMU establish procedures and implement controls in the monitoring of the PV Program to ensure that contractors comply with the requirements specified in their performance guarantee agreements and operation and maintenance agreements. This will improve the performance of the PV systems and protect the District's investment in the solar energy program.</p> <p>Some of the recommended controls include:</p> <p><u>True-up Reports</u> - EMU should keep track of the true-up report due dates, review true-up reporting, including adjustments made by the contractors to the guaranteed or actual production in the true-up report and ensure that the true-up report is prepared in accordance with the terms and conditions of the contract.</p> <p><u>Status of Guarantee Payments</u> - EMU should keep track of the status of guaranteed payments to ensure that the contractors make payments for those underproducing sites.</p> <p><u>System Damage and Stolen Equipment</u> - EMU should work closely and proactively</p>	<p>EMU agreed with the recommended controls and would keep track of true-up reports and the status of guaranteed payments, to reduce system downtime and ensure contractors' compliance with preventive maintenance. EMU requested additional resources to help it manage all the related PV contracts and maintenance requirements.</p>	<p>Not Implemented - As of the date of this review, ESO has not yet implemented the recommendation to establish formal procedures and robust controls for monitoring the photovoltaic program. Specifically, ESO has not developed a structured framework to ensure contractor compliance with the terms outlined in the performance guarantee agreements and the O&M contracts. However, management has acknowledged the need for stronger oversight and is currently in the process of updating internal procedures to improve monitoring practices and safeguard the District's investment in solar energy infrastructure.</p>

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	<p>with schools and other departments to reduce the risk of system damage and stolen equipment and minimize the solar energy production loss by shortening the repair time or system shutdown time when possible.</p> <p><u>Preventive Maintenance Reports</u> - EMU should review preventive maintenance reports, follow up with the issues identified in the reports and take appropriate actions to ensure the contractor's compliance with the contract requirements and improve the performance of the PV systems.</p>		
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APPENDIX II – LISTING OF PHOTOVOLTAIC PROGRAMS AND TRUE-UP PERIODS

No	Site IDs	Site Names	System Contractor	Start Date	End Date	True-Up Period
1	2269	Balboa Elementary Gifted/Highly Gifted/High Ability Magnet	SolarCity/ Tesla	2/26/2014	2/25/2024	2.5-year periods (x4)
2	1941	Benjamin Banneker Career and Transition Center	SolarCity/ Tesla	8/25/2013	8/24/2023	2.5-year periods (x4)
3	3577	Bellingham Elementary	SolarCity/ Tesla	9/25/2013	9/24/2023	2.5-year periods (x4)
4	8080	Richard E Byrd Middle School	SolarCity/ Tesla	6/5/2012	6/4/2022	2.5-year periods (x4)
5	8583	Chatsworth Charter High School	SolarCity/ Tesla	3/8/2013	3/7/2023	2.5-year periods (x4)
6	2307	Dr Sammy Lee Elementary Medical and Health Science Magnet	SolarCity/ Tesla	10/10/2016	10/9/2026	2.5-year periods (x4)
7	3548	Elizabeth Learning Center	SolarCity/ Tesla	6/15/2013	6/14/2023	2.5-year periods (x4)
8	8151	Henry T Gage Middle School	SolarCity/ Tesla	4/16/2012	4/15/2022	2.5-year periods (x4)
9	5849	Florence Griffith Joyner Elementary	SolarCity/ Tesla	2/26/2014	2/25/2024	2.5-year periods (x4)
10	4521	Hesby Oaks Leadership Charter	SolarCity/ Tesla	11/20/2012	11/19/2012	2.5-year periods (x4)
11	8721	Jordan Senior High	SolarCity/ Tesla	6/22/2013	6/21/2023	2.5-year periods (x4)
12	8882	Maywood Academy Senior High	SolarCity/ Tesla	9/17/2012	9/16/2022	2.5-year periods (x4)
13	1428	Maintenance & Operations North 1428	SolarCity/ Tesla	3/26/2015	3/25/2025	2.5-year periods (x4)
14	1393	Maintenance & Operations Central 1393	SolarCity/ Tesla	3/27/2015	3/26/2025	2.5-year periods (x4)
15	8779	Nathaniel Narbonne Senior High	SolarCity/ Tesla	7/11/2012	7/10/2022	2.5-year periods (x4)
16	2311	Marguerite Poindexter LaMotte Elementary	SolarCity/ Tesla	10/20/2012	10/19/2022	2.5-year periods (x4)
17	8814	Reseda Charter High School	SolarCity/ Tesla	9/25/2012	9/24/2022	2.5-year periods (x4)
18	6884	Lucille Roybal-Allard Elementary	SolarCity/ Tesla	11/4/2012	11/3/2022	2.5-year periods (x4)
19	8871	South Gate Senior High	SolarCity/ Tesla	6/9/2012	6/10/2022	2.5-year periods (x4)
20	8153	Southeast Middle School	SolarCity/ Tesla	7/11/2012	7/10/2022	2.5-year periods (x4)
21	8881	Southeast Senior High	SolarCity/ Tesla	6/13/2012	6/12/2022	2.5-year periods (x4)
22	7402	Stanley Mosk Elementary School	SolarCity/ Tesla	9/28/2012	9/27/2022	2.5-year periods (x4)
23	8396	Sun Valley Magnet: Engineering Technology	SolarCity/ Tesla	2/26/2014	2/25/2024	2.5-year periods (x4)
24	8921	Legacy Senior High Sci Tech Engineering Arts Math	SolarCity/ Tesla	9/17/2012	9/16/2022	2.5-year periods (x4)

25	2302	Michelle Obama Elementary School	SolarCity/ Tesla	10/10/2016	10/9/2026	2.5-year periods (x4)
26	8117	Vista Middle School	SolarCity/ Tesla	11/13/2012	11/12/2022	2.5-year periods (x4)
27	8487	Stephen M White Middle School	SolarCity/ Tesla	7/11/2012	7/10/2022	2.5-year periods (x4)
28	2309	Willow Elementary	SolarCity/ Tesla	9/19/2012	9/18/2022	2.5-year periods (x4)
29	2137	Ann Street Elementary	SunPower	7/1/2010	6/30/2020	N/A
30	8529	Phineas Banning Senior High	SunPower	8/1/2011	7/31/2021	N/A
31	8571	Canoga Park Senior High	SunPower	1/1/2011	12/31/2021	N/A
32	8590	Grover Cleveland Charter High School (multiple PV arrays)	SunPower	2/1/2011	1/31/2021	N/A
33	3541	El Dorado Avenue Elementary	SunPower	2/1/2011	1/31/2021	N/A
34	1366	Local District 5 Office (MO719)	SunPower	10/1/2011	9/30/2021	N/A
35	8544	Edward R. Roybal Learning Center	SunPower	6/1/2011	5/31/2021	N/A
36	8636	Polytechnic HS (Phase I) (MO720)	SunPower	5/1/2013	4/30/2023	N/A
37	8590	Grover Cleveland Charter High School (Phase II - multiple PV arrays)	Chevron/ Engie	12/1/2012	11/30/2022	Years 1-2, 3-5, 6-7, 8-10
38	8683	Ulysses S Grant Senior High	Chevron/ Engie	12/1/2012	11/30/2022	Years 1-2, 3-5, 6-7, 8-10
39	8358	San Fernando Middle School	Chevron/ Engie	4/1/2013	3/31/2023	Years 1-2, 3-5, 6-7, 8-10
40	8880	William Howard Taft Charter High School	Chevron/ Engie	12/1/2012	11/30/2022	Years 1-2, 3-5, 6-7, 8-10
41	8907	Venice Senior High	Chevron/ Engie	12/1/2012	11/31/2022	Years 1-2, 3-5, 6-7, 8-10
42	8928	George Washington Preparatory Senior High	Chevron/ Engie	12/1/2012	11/30/2022	Years 1-2, 3-5, 6-7, 8-10
43	8943	Westchester Enriched Sciences Magnets-Health/Sports Med Mag	Chevron/ Engie	12/1/2012	11/30/2022	Years 1-2, 3-5, 6-7, 8-10
44	8607	East Valley Senior High	Chevron/ Engie	12/1/2013	11/30/2023	Years 1-2, 3-5, 6-7, 8-10
45	8116	Roy Romer Middle School	Chevron/ Engie	12/1/2013	11/30/2023	Years 1-2, 3-5, 6-7, 8-10
46	8843	San Fernando Senior High	Chevron/ Engie	12/1/2013	11/30/2023	Years 1-2, 3-5, 6-7, 8-10
47	8851	San Pedro Senior High Marine Science/Tech/Math Magnet	Chevron/ Engie	11/1/2014	10/31/2024	Years 1-2, 3-5, 6-7, 8-10
48	7408	Sylmar Leadership Academy	Chevron/ Engie	11/1/2014	10/31/2024	Years 1-2, 3-5, 6-7, 8-10
49	8901	Cesar E Chavez Learning Academy - Technology Preparatory Aca	Chevron/ Engie	12/1/2013	11/30/2023	Years 1-2, 3-5, 6-7, 8-10
50	8142	Robert Fulton College Preparatory School	Chevron/ Engie	12/1/2013	11/30/2023	Years 1-2, 3-5, 6-7, 8-10

51	2303	Porter Ranch Community School	Chevron/ Engie	12/1/2013	11/30/2023	Years 1-2, 3-5, 6-7, 8-10
52	8636	John H Francis Polytechnic Senior High (Freshmen Academy)	Chevron/ Engie	12/1/2013	11/30/2023	Years 1-2, 3-5, 6-7, 8-10
53	8867	Diego Rivera Learning Complex Public Service Community	Solar Monkey/Hanwha	12/1/2012	11/30/2022	Years 1-3, 4-5, 6-8, 9-10
54	8868	Rancho Dominguez Preparatory School	Solar Monkey/Hanwha	9/10/2012	9/9/2022	Years 1-3, 4-5, 6-8, 9-10
55	2312	Gerald A Lawson Academy of the Arts Math Science Elementary	Solar Monkey/Hanwha	10/22/2012	10/21/2022	Years 1-3, 4-5, 6-8, 9-10
56	2313	Dr Lawrence H Moore Math Science Technology Academy	Solar Monkey/Hanwha	9/14/2012	9/13/2022	Years 1-3, 4-5, 6-8, 9-10
57	8664	Gardena Senior High	Solar Monkey/Hanwha	12/1/2012	11/30/2022	Years 1-3, 4-5, 6-8, 9-10
58	2251	Camino Nuevo Academy #4	Solar Monkey/Hanwha	7/26/2016	7/25/2026	Years 1-3, 4-5, 6-8, 9-10
59	1404	Gardena Bus Garage (1404)	PermaCity	6/22/2013	6/21/2023	2.5-year periods (x4)
60	8577	Sonia Sotomayor Arts and Sciences Magnet	PermaCity	6/1/2013	5/31/2023	2.5-year periods (x4)
61	8103	Glenn Hammond Curtiss Middle School	PermaCity	9/27/2013	9/26/2023	2.5-year periods (x4)
62	8853	Orthopaedic Hospital Senior High Medical Magnet	PermaCity	12/1/20213	11/30/2023	2.5-year periods (x4)

APPENDIX III – FSD’s PROJECTED SAVINGS

Energy Savings over 20 year period

Year	Annual AC Energy (kWh)	Electric Rate (\$/kWh)	Energy Value (\$)
1	32,526,512	\$ 0.156	\$ 5,074,136
2	32,201,247	\$ 0.159	\$ 5,123,862
3	31,879,234	\$ 0.162	\$ 5,174,076
4	31,560,442	\$ 0.166	\$ 5,224,782
5	31,244,838	\$ 0.169	\$ 5,275,985
6	30,932,389	\$ 0.172	\$ 5,327,690
7	30,623,065	\$ 0.176	\$ 5,379,901
8	30,316,835	\$ 0.179	\$ 5,432,624
9	30,013,666	\$ 0.183	\$ 5,485,864
10	29,713,530	\$ 0.186	\$ 5,539,625
11	29,416,394	\$ 0.190	\$ 5,593,914
12	29,122,230	\$ 0.194	\$ 5,648,734
13	28,831,008	\$ 0.198	\$ 5,704,092
14	28,542,698	\$ 0.202	\$ 5,759,992
15	28,257,271	\$ 0.206	\$ 5,816,440
16	27,974,698	\$ 0.210	\$ 5,873,441
17	27,694,951	\$ 0.214	\$ 5,931,000
18	27,418,002	\$ 0.218	\$ 5,989,124
19	27,143,822	\$ 0.223	\$ 6,047,818
20	26,872,384	\$ 0.227	\$ 6,107,086
TOTAL	592,285,218		\$ 111,510,185

Assumptions

Annual electricity rate increase is 2%.

Annual degradation rate (reduction in kWh production) of PV panels is 1%.

Note:

The \$112M savings estimate is from 2011 and is stated in 2012 SEP.

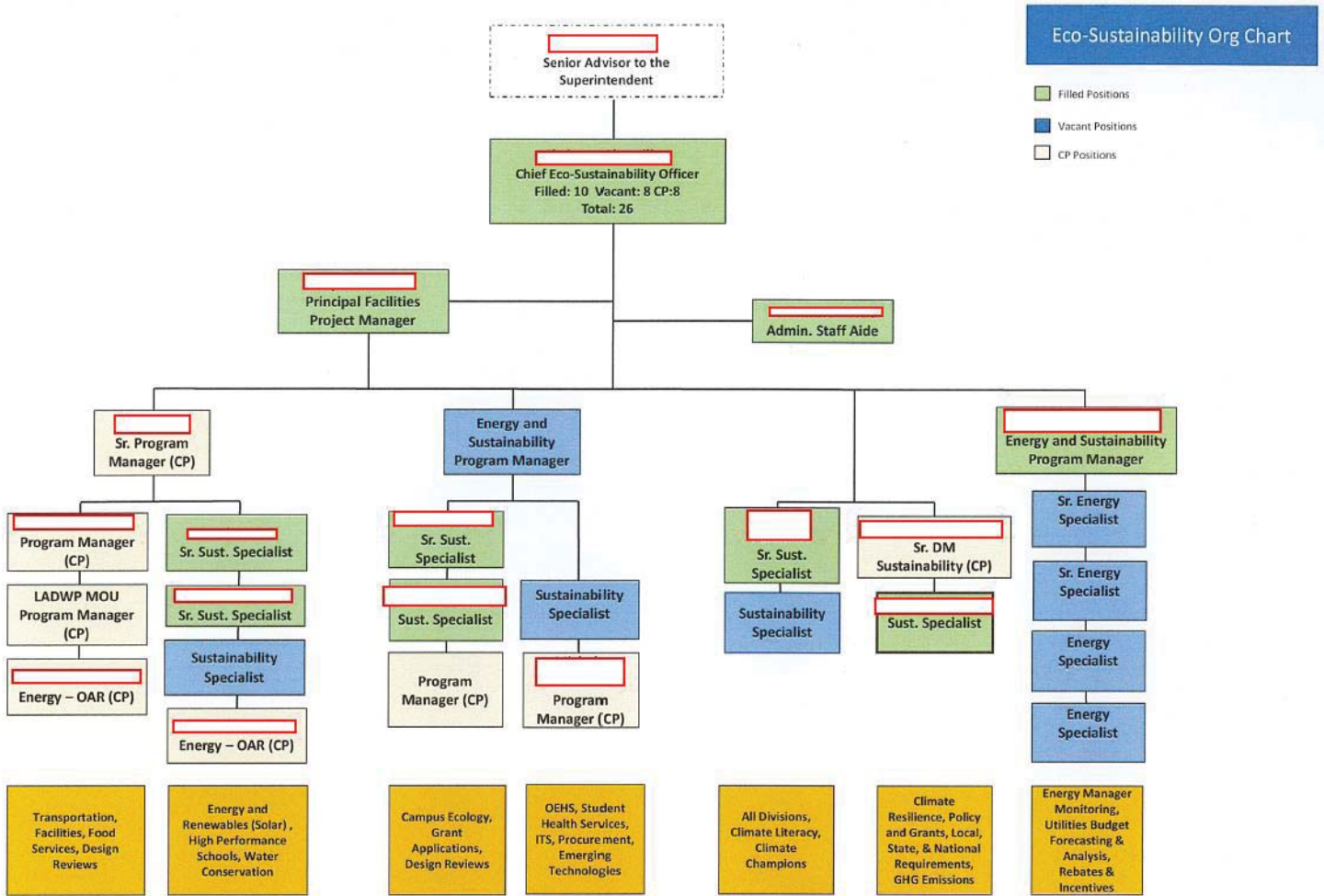
Please see the attached results from PVWatts® calculator tool (provided by the National Renewable Energy Laboratory for the U.S. Department of Energy) for details.

Default values were used while estimating the projected PV energy production except for the following:

1. Location: Zip code 90017 (Los Angeles)
2. DC system size: 20,900 kW (20.9 MW)
3. Avg. retail electricity rate: \$0.156/kWh (blended electricity rate for 2011)
4. Annual AC Energy: 32,526,512 kWh (conservative estimate).

PVWatts Calculator website: <https://pvwatts.nrel.gov/index.php>

APPENDIX IV – ESO’s ORGANIZATIONAL CHART



01/16/2025

APPENDIX V – ESO’s RESPONSES TO SPECIAL REVIEW RECOMMENDATIONS

INTEROFFICE CORRESPONDENCE

Los Angeles Unified School District
Office of the Superintendent

TO: Kien Hong, CPA, CIGA
Forensic and Support Service Manager
Office of the Inspector General

DATE: March 17, 2026

FROM: Christos Chrysiliou, Chief Eco-Sustainability Officer

**SUBJECT: WRITTEN RESPONSE TO THE FINDINGS AND RECOMMENDATIONS
OF THE DRAFT SPECIAL REVIEW OF THE DISTRICT’S
PHOTOVOLTAIC PROGRAM**

Thank you for sharing the draft report of the Special Review of the District’s Photovoltaic Program, dated February 24, 2026, for our review. The attachment is our written response to the findings and recommendations outlined in the report which indicates our level of agreement, actions we plan to take, and target date to implement those actions. ESO also coordinated with M&O TSU on responses to Finding 1 – Recommendations 1.2 and Finding 7 – Recommendation 7.

If you have any questions, please contact Christos Chrysiliou, Chief Eco-Sustainability Officer, at christos.chrysiliou@lausd.net, or Peter Yee, Senior Project Manager, at peter.yee@lausd.net.

Attachment: Summary spreadsheet of our responses.

c: Jaime Torrens
Dennis Bradburn
Mark Cho
Miguel Garcia
Peter Yee

LAUSD - ECO-SUSTAINABILITY OFFICE
 SOLAR PV PROGRAM
 OIG SPECIAL REVIEW - RESPONSE TO FINDINGS AND RECOMMENDATIONS

Prior Audit Cross Reference	No.	Findings & Recommendations	Agreement Level	Lead Unit	Action Plan	Implementation Date
	1.0	Actual Energy Production Was Below Expected Levels: Actual solar energy production was significantly lower than expected due to periods of system downtime and various operational issues, such as broken panels and delayed repairs.	Agree			
I-1, I-2, II.B	1.1	ESO should implement a centralized process to monitor PV system performance, reconcile actual versus expected energy output, document downtime, and verify contractor true-up adjustments.	Agree	ESO	See notes 1 and 2.	Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
II.C	1.2	ESO should coordinate with the District's Maintenance & Operations (M&O) Technical Unit to confirm field conditions reported by contractors. For sites with prolonged equipment issues, ESO should coordinate with M&O Technical Unit and contractors to expedite repairs.	Agree	ESO M&O	ESO and M&O/TSU to define roles and responsibilities on how to confirm needed repairs and how to coordinate and monitor service calls. Develop internal procedures and checklists.	Action Plan to be developed by 7/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
	2.0	Actual Energy Saving Was Below the Estimates: Actual solar generation over the first 10 years totaled approximately 224.0 million kWh, compared to 311.0 million kWh projected by the ESO. This underperformance reduced the District's expected financial benefits, yielding \$37.86 million in savings, or \$15.18 million less than anticipated.	Agree			
I-1, I-2, II.B	2.1	ESO should establish a centralized dashboard to monitor energy generation, efficiency trends, cost savings, and utilize verified performance data from existing systems to inform future PV project planning and decisions.	Agree	ESO	See notes 1 and 2.	Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
II.C	2.2	ESO should verify any claimed production adjustments by reviewing supporting documentation, historical performance data, and calculations that account for panel degradation and actual weather conditions.	Agree	ESO	See notes 1 and 2.	Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
	3.0	Outstanding Guarantee Payments for Underperforming Solar Systems: Several District PV systems failed to meet the contractual guaranteed performance threshold of 95% of expected energy production, resulting in an estimated \$616,114 in guaranteed payments owed to the District.	Agree			

LAUSD - ECO-SUSTAINABILITY OFFICE
SOLAR PV PROGRAM
OIG SPECIAL REVIEW - RESPONSE TO FINDINGS AND RECOMMENDATIONS

Prior Audit Cross Reference	No.	Findings & Recommendations	Agreement Level	Lead Unit	Action Plan	Implementation Date
	3.1	ESO should recover the \$616,114 in underpaid guaranteed payments from the responsible contractors.	Agree	ESO	ESO will request delinquent True-Up reports from the solar vendors and determine appropriate guarantee payment based on actual production and appropriate weather adjustment factor. Shortfall payments will be collected if system has underperformed. To date, ESO has collected \$2,330,899.46 in guaranteed payments.	Requests will be made by 7/1/2026, but full time analysis and support dependent on approval of vacant positions. See note 3.
II.C, III.1	3.2	ESO should assign specific staff within the ESO to oversee performance guarantee compliance, including the review of true-up reports, calculation of the Accrual/Payment for each true-up period (including adjustment factor such as SEAMC/SETMC), verification of contractor calculations, and tracking of payments owed or received. In addition, standardized monthly procedures with defined timelines, responsibilities, and documentation should be established to ensure consistency and accountability.	Agree	ESO	See note 1.	Staff assignments dependent on approval of vacant positions. See note 3.
I-1; II.1	4.0	Lack of Active Monitoring of Guaranteed Energy Production: The ESO has not established a formal process to monitor guaranteed energy production, reconcile actual versus expected output, or pursue payments for contractor underperformance. Despite having access to production data, ESO does not consistently review true-up reports, validate results, or document follow-up with contractors.	Agree	ESO		
I-1	4.1	ESO should implement a formal monitoring process and standardized protocol to routinely compare actual energy production with contractual guarantees, including data collection and validation of true-up reports.	Agree	ESO	See note 1 and 2.	Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
III.1	4.2	ESO should develop a centralized dashboard to track PV performance data (expected versus actual production, shortfalls, and payments) and maintain a record of related documentation and reconciliations.	Agree	ESO	See note 1 and 2.	Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
	5.0	Delayed and Missing True-Up Reports: Of the 41 true-up reports due from solar contractors, only 16 (39%) were received, and all were submitted late. While Engle eventually provided all 16 reports, Tesla, Hanwa, and PermaCity had multiple missing or overdue submissions. As a result, the District was unable to timely verify whether contractors met the guaranteed performance thresholds or owed compensation for underproduction, exposing the District to potential financial losses and reduced oversight of solar program performance.	Agree			

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 SOLAR PV PROGRAM
 OIG SPECIAL REVIEW - RESPONSE TO FINDINGS AND RECOMMENDATIONS

Prior Audit Cross Reference	No.	Findings & Recommendations	Agreement Level	Lead Unit	Action Plan	Implementation Date
II.1, V	5.1	ESO should assign staff to manage and monitor all contractor true-up reports and implement a centralized tracking system that records due dates and receipt statuses. The assigned staff should also proactively request missing reports when due and perform follow-up procedures to ensure the timely submission of the true-up reports.	Agree	ESO	See note 1 and 2. ESO will request delinquent True-Up reports from the solar vendors and determine appropriate guarantee payment based on actual production and appropriate weather adjustment factor. Shortfall payments will be collected if system has underperformed.	Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
	6.0	Lack of Review and Oversight of Energy Production Database: Although contractors provided the ESO with access to web-based data acquisition systems (DAS) for real-time solar performance monitoring, ESO has not been actively reviewing or verifying production data.	Agree			
	6.1	ESO should develop written procedures defining monitoring frequency, variance thresholds, and notification protocols for declining energy output.	Agree	ESO	See note 1 and 2. ESO to develop these parameters and incorporate into centralized reporting and monitoring system.	Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
	6.2	ESO should assign staff to routinely monitor and verify energy production data from each contractor's web-based DAS.	Agree	ESO	See note 1 and 2. ESO to develop schedule to spot check data collected by centralized system against contractor's web-based data acquisition systems (DAS).	Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
	6.3	ESO Management should conduct periodic reviews to ensure monitoring is consistent and system issues are promptly resolved to maintain optimal energy generation.	Agree	ESO	See note 1 and 2. ESO to set parameters in centralized system that will send alarms if production falls below certain predetermined levels.	Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
I-1	7.0	Lack of Oversight and Preventive Maintenance: From July 1, 2020 to June 30, 2025, the contractors failed to meet preventive maintenance (PM) requirements, completing only 12 of 470 scheduled services, a compliance rate of 2.55%. Contractors such as Tesla and Hanwha reported no PM activity, while PermaCity and Engle completed six each.	Agree			
I-1, III.1, III.2, V	7.0	ESO and M&O should develop a centralized system to track all PV operations and maintenance (O&M) activities, including panel washing and preventive maintenance. The system should: <ul style="list-style-type: none"> Record site-level service details, contractor, and verification. Require uploads of supporting documents (logs, reports, photos). Clarify ESO-M&O roles and data ownership through formal procedures to ensure accountability. 	Agree	M&O ESO	See note 1 and 2. M&O TSU to take lead on scheduling and monitoring annual panel washings and annual preventative maintenance services and create tracking spreadsheet in a shared drive. M&O TSU to utilize Maximo to track all service calls and work orders as necessary. ESO to assist with document review and contractual support.	M&O TSU to utilize Maximo and implement tracking spreadsheet by 11/1/26. ESO full support dependent on approval of vacant positions. See note 3.

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 SOLAR PV PROGRAM
 OIG SPECIAL REVIEW - RESPONSE TO FINDINGS AND RECOMMENDATIONS

Prior Audit Cross Reference	No.	Findings & Recommendations	Agreement Level	Lead Unit	Action Plan	Implementation Date
	8.0	<p>Panel Washing Services Not Performed as Required: Between July 1, 2020, and June 30, 2025, the contractors completed only 17 of 275 required panel washing services, a compliance rate of 6.18%. Minimal activity. The widespread failure to perform panel washing reflects serious lapses in contractor compliance and oversight.</p> <p>The District incurred an average annual cost of \$386,834 for O&M activities such as Preventive Maintenance (PM) and Panel Washing (PW) services, for a total of \$1,534,171 during the five-year scope of this review. However, of the total 745 required O&M activities (i.e., 470 PM services and 275 PW services), only 29 (12 PM services and 17 PW services) were performed, representing a service completion rate of 3.89%. Although the District paid \$386,834 for annual O&M activities, only 3.89% of the O&M activities were rendered, equating to an annual value of \$563,235 of O&M services not performed, or \$1,816,174 over the five-year period. The District should be reimbursed \$1,816,174 for O&M services not rendered.</p>	Agree			
III.2	8.1	<p>ESO should require contractors to submit updated service plans detailing how they will make up missed washes and maintain future compliance.</p>	Agree	ESO	<p>See note 1 and 2.</p> <p>ESO will schedule meetings with each solar vendor to discuss delinquent true-up reports, solar PV systems not reporting, solar PV systems not producing, missed annual panel washings and missed annual preventative maintenance services. ESO to allow option of extended panel washings and preventative maintenance services beyond the 20 year O&M agreement to make up for missed services or to reimburse the District.</p>	<p>Meetings and discussions to be held with each vendor by 7/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.</p>
III.2.V	8.2	<p>ESO should implement a centralized tracking system with real-time monitoring, automated alerts, digital service logs, and audit-ready reporting features.</p>	Agree	ESO	<p>See note 1 and 2.</p>	<p>Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.</p>
	8.3	<p>ESO should prioritize site inspections for locations that have gone multiple years without documented panel washing and determine whether performance degradation and equipment damage are due to a lack of cleaning.</p>	Agree	ESO	<p>See note 1 and 2.</p> <p>Through the centralized monitoring system, ESO will prioritize those sites with missed panel washing and compare actual production data and against guaranteed production and take appropriate action.</p>	<p>Implement centralized monitoring system by 10/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.</p>

LAUSD - ECO-SUSTAINABILITY OFFICE
 SOLAR PV PROGRAM
 OIG SPECIAL REVIEW - RESPONSE TO FINDINGS AND RECOMMENDATIONS

Prior Audit Cross Reference	No.	Findings & Recommendations	Agreement Level	Lead Unit	Action Plan	Implementation Date
	8.4	ESO should recover \$1,816,174 of O&M activities that were not rendered by the contractors.	Agree	ESO	See note 1 and 2. ESO will schedule meetings with each solar vendor to discuss delinquent true-up reports, solar PV systems not reporting, solar PV systems not producing, missed annual panel washings and missed annual preventative maintenance services. ESO to allow option of extended panel washings and preventative maintenance services beyond the 20 year O&M agreement to make up for missed services or to reimburse the District.	Meetings and discussions to be held with each vendor by 7/1/2026 but full time support and monitoring dependent on approval of vacant positions. See note 3.
	9.0	Prior Audit Recommendations Not Implemented: A follow-up review found that six of 12 prior recommendations were not implemented, two were partially implemented, and four were fully implemented. The ESO attributed the lack of progress to staffing and funding constraints.	Agree			
	9.1	ESO should assess all 12 prior recommendations, prioritize those with the greatest impact on compliance, cost savings, and program effectiveness, and establish clear and achievable implementation timelines with interim milestones to ensure sustained progress.	Agree	ESO	See note 1. ESO has reviewed the prior recommendations and cross referenced against current, similar recommendations to combine as one task for prioritization and tracking.	On going monitoring of prior, and current recommendations will be dependent on approval of vacant positions. See note 3.
	9.2	ESO should implement a monitoring and reporting mechanism to track the status of each outstanding recommendation, provide regular progress updates (e.g., quarterly) to ESO Management, and conduct periodic internal reviews to evaluate the effectiveness of newly implemented procedures and make adjustments as needed.	Agree	ESO	See note 1. ESO to track combined recommendations and will assess and review effectiveness of renewed procedures and efforts on a regular basis to address all open recommendations.	On going monitoring of prior and current recommendations will be dependent on approval of vacant positions. See note 3.

NOTES:

- Request made since December 2020 to fill vacant Sr. Energy Specialist and Energy Specialist position to perform and support these tasks.
- Working with Consultant to develop and implement a centralized, cloud based reporting and monitoring system. Centralize system shall have capability of collecting current production data, analyzing and comparing historical production and savings with baseline data, setup alarms when systems are not producing or underproducing so that ESO and M&O TSU can investigate. Collect and apply weather adjustment factors to overall analysis.
- Full time management, support and monitoring to start 6 months from Personnel Commission's approval to fill vacant positions for Energy Specialist and Sr. Energy Specialist.

APPENDIX VI – SUMMARY OF TARGET DATES AND ACTIONS TO BE TAKEN

ESO stated that the implementation of these agreed-upon actions is currently hindered by critical staff shortages – specifically, the vacant Energy Specialist and Senior Energy Specialist roles. Following a denied request for personnel in October 2025, ESO has not submitted a subsequent request to the Personnel Commission. ESO is also evaluating technological solutions, including a centralized, cloud-based monitoring and reporting system. However, according to ESO, full-time management, support, and monitoring of the system remains contingent upon the hiring of the vacant positions. This contingency is applicable to the all agreed-upon actions below.

SUMMARY OF TARGET DATES AND ACTIONS TO BE TAKEN IN RESPONSE TO SPECIAL REVIEW RECOMMENDATIONS	
TARGET DATES	ACTIONS TO BE TAKEN
Wednesday, July 1, 2026	Response to Recommendation #1.2: ESO will coordinate with the District’s M&O Technical Unit to define roles and responsibilities on how to confirm repairs and how to coordinate and monitor service calls. ESO will develop internal procedures and checklists.
Wednesday, July 1, 2026	Response to Recommendations #3.1 and 5: ESO will request delinquent true-up reports from solar vendors and determine the guaranteed payments based on actual production and the applicable weather adjustment factors. ESO further stated that they will collect shortfall payments from the contractor if the PV system has under-performed.
Wednesday, July 1, 2026	Response to Recommendations #8.1 and 8.4: ESO will schedule meetings with each solar vendor to address outstanding issues. Furthermore, at these meetings, ESO will discuss delinquent true-up reports, PV systems that are not producing or reporting, and missed annual PM and PW services. ESO will allow solar vendors the option of extending PM and PW services beyond the 20-year O&M agreement to make up for missed services, or reimbursing LAUSD.

SUMMARY OF TARGET DATES AND ACTIONS TO BE TAKEN IN RESPONSE TO SPECIAL REVIEW RECOMMENDATIONS	
TARGET DATES	ACTIONS TO BE TAKEN
Thursday, October 1, 2026	Response to Recommendations #1.1, 2.1, 2.2, 3.2, 4.1, 4.2, 5 and 8.2: ESO will develop a centralized, cloud-based monitoring system with real-time data tracking, performance analysis, automated alerts, and weather-adjusted reporting.
Thursday, October 1, 2026	Response to Recommendations #6.1, 6.2, and 6.3: ESO will (a) develop the written procedures defining monitoring frequency, variance thresholds, and notification protocols for declining energy output; (b) develop a schedule to spot check and compare data collected by the centralized system against the solar contractors' web-based DAS; and (c) set parameters in the centralized system to send alarms if production falls below certain predetermined levels.
Thursday, October 1, 2026	Response to Recommendation #8.3: Through the centralized monitoring system, ESO will prioritize sites with missed panel washing, compare actual production data against guaranteed production, and take appropriate action.
Sunday, November 1, 2026	Response to Recommendation #7: M&O Technical Unit will take the lead in scheduling and monitoring the annual panel washings and annual preventative maintenance services. M&O Technical Unit will also utilize Maximo to track all service calls and work orders, and implement a tracking spreadsheet for these service calls and work orders. ESO will assist with document review and contractual support.

**SUMMARY OF TARGET DATES AND ACTIONS TO BE TAKEN
IN RESPONSE TO SPECIAL REVIEW RECOMMENDATIONS**

TARGET DATES	ACTIONS TO BE TAKEN
Ongoing	<p>Response to Recommendations #9.1 and 9.2: ESO reviewed the prior recommendations and cross-referenced them against current, similar recommendations to combine as one task for prioritization and tracking. ESO will track the combined recommendations and regularly assess and review the effectiveness of renewed procedures and efforts to address all open recommendations.</p>

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