

### CPUC Staff Ex Ante Review

CPUC Staff Project ID Number	PGE 22 T A 772 PRJ - 03736034 Lighting
CMPA Directory Link	<a href="https://deeresources.info/cmpa/projects/20365">https://deeresources.info/cmpa/projects/20365</a>
PA	PGE
PA Application ID	PRJ - 03736034
PA Application Executed Date	
PA Program ID	SW_NC_NonRes_Ag_mixed
PA Program Name	California Design Assistance CEDA Ag-Mixed
PA Program Year	
Date of CPUC Staff Review:	6/9/2022
PA CMPA Upload Dates Included in this review:	
First PA Upload	5/17/2022
Second PA Upload	N/A
Third PA Upload	N/A
Fourth PA Upload	
Fifth PA Upload	
Sixth PA Upload	
Seventh PA Upload	
Eighth PA Upload	
PA Measure Description(s):	
Measure 1	LIGHTING RETROFITNEW-INT LED HORTICULTURAL
Measure 2	
Measure 3	
Measure 4	
Measure 5	
Measure 6	
Measure 7	
Measure 8	
Measure 9	
Measure 10	
PA Project Description:	This is a major alterationnew load NC project and the applicable measure solution code is CLA21 This project proposes to install horticultural LED fixtures for the entire new indoor horticulture facility rather than using the traditional industry standard practice ISP of high-pressure sodium HPS and ceramic metal halide CMH grow lights
Bi-Monthly Upload kW Demand Reduction	0.0
Bi-Monthly Upload Annual kWh Impacts	241,053.0
Bi-Monthly Upload Therm Impacts	0.0
PA Proposed Incentive \$ (to Customer)	\$12,283.49
Project Documentation kW Demand Reduction	0.0
Project Documentation Annual kWh Impacts	241,053.0
Project Documentation Annual Therm Impacts	0.0
Project Documentation Incentive \$ (to Customer)	12,416.4
CPUC Staff Primary Reviewer Name	
CPUC Staff Primary Reviewer Firm	Quantum Energy Analytics
CPUC Staff Review Supervisor Name	
CPUC Staff Review Supervisor Firm	Quantum Energy Analytics
PA Primary Reviewer Name	
PA Primary Reviewer Firm	
CPUC Staff Project Manager	
CPUC Staff Policy Authorization (as needed)	
CPUC Staff Recommendation:	Application rejected.
For rejection, action required:	N/A
M&V Review:	Post M&V Review NOT Required

Action Number:	Summary of CPUC Staff Required Action by the PA:	Action Category	PA Response	ED Resolution
----------------	--	-----------------	-------------	---------------

1	<p>The PA used a calculator (i.e., Grow Green calculator) that does not accurately estimate savings for cannabis grow lighting projects. CPUC staff has issued several dispositions asking the PA to update the calculator, but the PA has disregarded this request. In fact, in the project files the PA indicates that the “Grow Green calculator is an approved tool by PG&amp;E for horticultural lighting projects.” The PA is required to update the Grow Green calculator to address the following issues. All custom cannabis lighting projects should follow these directions.</p> <p>1) The PA did not follow the standard practice baseline development process as directed in CPUC resolution E-4939 and relied on the tool’s embedded assumptions for baseline efficacies (i.e., Photosynthetic Photon Efficacy or PPE). These baseline assumptions are not supported by data and do not follow the procedure set in place for developing standard practice baselines for lighting and other custom projects. The PA and the program implementor are both familiar with this process as they were involved with making similar revisions to the Modified Lighting Calculator. The Grow Green calculator is currently using standard practice baseline efficacy values that are based on a very limited number of high intensity discharge (HID) lighting fixtures. These few fixtures do not correctly account for products that are available to be purchased in the California market and are commonly used by growers. We are requesting the PA to perform additional research to 1) show the appropriate lighting technology mix for growing cannabis in California, and 2) the appropriate baseline efficacy values associated with this technology mix, using the same approach as the one used for general LED lighting projects (i.e., MLC and lighting workpapers). The PA should clearly state how the final standard practice baseline values are related to grow stages (propagation, vegetative, flowering and mother stage), grow architecture (stacked vs non-stacked) and any other relevant variable (e.g., supplemental greenhouse vs fully indoor). The PA is also required to propose a procedure for updating these values on a regular basis.</p> <p>2) The PA is required to define a minimum efficacy for LED cannabis grow products based on LEDs that are available to growers in the California market, using the approach that is consistent with setting the minimum requirements for general LED lighting projects (i.e., MLC and lighting workpapers). The installed LED fixture should meet this minimum requirement.</p> <p>3) The tool has embedded assumptions for the unit cost of energy (\$/kWh, \$/kW and \$/therm) that are not trued up until after project is fully installed and operational (i.e., post-installation stage). Given project cost savings are directly tied to program influence and the customer decision making for most cannabis lighting projects, the PA is required to perform additional research to make sure these assumptions are accurate. The utility bills for this project shows a unit cost of \$0.26/kWh. Using \$0.26/kWh for this project will result in a payback of less than 2 years. After addressing additional cost assumptions errors (as explained below), the project payback would be even shorter.</p> <p>4) The tool estimates HVAC interactive effects based on oversimplified assumptions that is not consistent with how HVAC interactive effects are estimated for other custom projects and/or deemed measures. If interactive effect savings are included in the project scope, a whole building modeling approach (similar to the DEER approach) should be used to accurately estimate HVAC interactive impacts.</p>	Calculation tool		
2	<p>The PA did not provide convincing evidence to show that installation of LEDs more likely than not resulted from the program. All provided evidence indicate that the customer would likely install LEDs (rather than high intensity discharge lighting) absent of program:</p> <p>1) The customer has already installed LEDs at a different facility. According to the PA, the customer is not happy with the performance of LEDs at that facility (no evidence was provided to support this claim), and yet, the customer asked for a specific brand of LED for this project. According to the project documentation, the customer was initially considering to install LEDs for this project</p> <p>2) No evidence (e.g., building plans) was provided to show that the customer was planning to install HIDs</p> <p>3) The baseline equipment (HID) quotes are dated after project was already developed</p> <p>4) The cost is listed as the primary decision-making driver for the customer but the actual payback of the project (see notes below) is, in fact, much shorter than what is presented in the project files</p> <p>5) In addition to savings energy and generating less heat, benefits of LEDs include even distribution of the light source over the canopy which prevents uneven growth pattern, and the ability of LEDs to target the portion of the light spectrum that is most beneficial to cultivation. Moreover, LEDs can be mounted much closer to the plant canopy as the heat generation is substantially lower than incumbent technologies. This in turn results in higher efficacy and more plants per available grow space. Recent studies have also showed LED lights had only a minor impact on yield while showing an increase in plant’s THC (Tetrahydrocannabinol) levels. The PA chose to ignore all of these benefits and only focus on upfront costs (which is not calculated correctly as explained below)</p>	Program influence		
3	<p>The PA did not correctly estimate the incremental costs (IMC) for this project. The PA calculated IMC as a simple difference between total initial cost of purchasing LEDs and total initial cost of purchasing HID fixtures. This is not an appropriate comparison because HID grow lights must be replaced as often as 6 months to a year. For instance, manufacturers’ rated life for metal halide (MH) ranges from 10,000 to 12,000 hours. In years, this would approximately range from 1.5-2 years for an 18-hour photoperiod (common for vegetative stage). Manufacturers’ rated life for ceramic metal halide (CMH) ranges from 10,000 to 15,000 hours. In years, this would approximately range from 1.5-3 years for an 18-hour photoperiod. However, manufacturer’s replacement guides and previous studies have shown MH and CMH lights must be replaced as often as 6 months to a year indicating shorter lifetimes than rated hours. Manufacturers’ rated life for high pressure sodium (HPS) lighting shows that rated life ranges from 10,000 to 32,000 hours. In years, this would approximately range from 2-7 years for a 12-hour photoperiod (common for flowering stage). However, manufacturer’s replacement guides and previous studies have shown HPS lights must be replaced as often as 6 months to a year indicating shorter lifetimes than rated hours.</p> <p>We have provided additional details below regarding measure life but these are just examples to show that the PA is required to do the due diligence research and analysis to establish service equivalency between the technologies when developing IMC and comparing HIDs to LEDs. Note that according to the PA, the cost is the primary decision-making driver for most cannabis lighting projects (including this project) but the PA did not include the added replacement costs associated with HID fixtures in the analysis.</p>	Measure cost		
4	<p>The PA did not correctly estimate the measure life. The PA estimated the effective useful life (EUL) of the project by simply dividing 50,000 hours of lifetime for non-horticultural LED by the facility operating hours. This is not appropriate because the non-horticultural LED fixtures use the L70 measurement (hours a fixture will maintain 70% of the total original lumen output) but the horticultural lighting uses either the L90 or Q90 measurement (the number of hours a fixture can maintain 90% of its original output). This should be used as the basis for the EUL of horticultural LED lighting. This is also applicable to the measure life of non-LED horticultural lighting. This issue should be addressed in the Grow Green calculator rated life assumptions as well.</p>	EUL/RUL		
5	<p>The PA used an outdated custom ISP (Industry Standard Practice) study that was developed for prior cannabis lighting retrofit projects. In our prior dispositions, we have listed reasons why this custom ISP study should not be used to establish the standard practice baseline for cannabis lighting projects. The PA has disregarded this feedback.</p>	Baseline		
6	<p>The PA did not clearly identify that this project involves vertical/stacked operation in the vegetative and clone rooms and how this would impact the baseline equipment choice.</p>	Missing required information		

Note or Instruction Number:	CPUC Staff Notes or Instructions:	Instruction Category	PA Response	ED Resolution

CPUC Staff Recommendation Definitions	
CPUC Staff Recommendation	Definition
Application ready to proceed without exception	The PA will continue to upload application documents to the CMPA directory through the implementation and claims phases of the project. The PA may proceed to approve the project without waiting for CPUC Staff response. A project is waived from further review at the post-installation stage by CPUC staff, but the PA is responsible for post-installation (IR) review. There will not be conditional approval.
Application ready to proceed with exception(s), as noted	<p>The PA must make revisions or changes as noted in CPUC Staff's review comments before signed agreement with customer. The PA will continue to upload application documents to the CMPA directory through the implementation and claims phases of the project. The PA may proceed to approve the project without waiting for CPUC Staff response. If CPUC Staff decides to perform IR review of a project, CPUC Staff will notify the PA. The scope will be limited to determine if the project was carried out consistent with the application and notes provided during pre-installation review and to obtain information pertaining to whether the eligibility criteria or metrics should be revised.</p> <p>Unless the scope of work presented in project application has changed at IR review, the project will not be reviewed again in the areas specified below. Scope change is defined by substantial changes include significant modifications to the proposed equipment type, size, quantity, configuration, the expansion of a project to include additional retrofits, or the splitting of a project into multiple phases.</p> <p>The following areas will not be reviewed again by CPUC Staff:</p> <ul style="list-style-type: none"> <li>• Calculation Tool</li> <li>• Calculation Methodology</li> <li>• M&amp;V Plan</li> <li>• Baseline</li> <li>• Eligibility</li> <li>• EUL/RUL</li> <li>• Measure Type</li> <li>• Program Influence</li> </ul>
Application rejected.	<p>The application is rejected as submitted. The PA shall promptly inform the applicant as to the reasons why the project was rejected and the specific recommendations for the conditions under which the project would be approved. CPUC Staff shall provide the reasons for the rejection or request for modification, including each basis as to why the project is rejected, or modification is requested. In addition, CPUC Staff shall provide specific recommendations for the conditions under which the project would be approved.</p> <p>If any party to the project is unsatisfied with the Commission's directions for the project, a dispute resolution process may be initiated by that party. The Commission shall adopt rules for the conduct of the dispute resolution process. – Section 381.2 (g) (3) (F)</p>
Advisory.	The PA is not formally required to follow instructions or recommendations given in an Advisory review. However, issues found will affect ESPI scoring and may come up again in Ex-Post review.