



City of Santa Fe New Mexico

Memorandum



Date: May 23, 2021

To: Governing Body

From: Regina Wheeler, Public Works Department Director

RE: Recommended Community Guided Lighting Design

ITEM AND ACTION:

Approval of a Lighting Design for the Conversion of Streetlights in the City to LEDs to be incorporated into the City's Global Management Performance Contract with Dalkia Energy Solutions, LLC, Contract #3202498, and the Streetlight Conversion Contract with the Public Service Company of New Mexico (PNM), Contract #3202499, as Applicable to Each Contract. (Regina Wheeler, PW Director, rawheeler@santafenm.gov)

BACKGROUND:

On February 24, 2021, the Governing Body approved a renewable energy and energy efficiency package that included a \$17,200,000 municipal bond and two guaranteed energy savings performance contracts to design, procure, coordinate with utility and construct solar, indoor LED lighting retrofits, water conservation measures and conversion of streetlights to LEDs. Using the guaranteed energy savings of the combined project, the City was able to secure financing for these concrete actions toward achieving the goal of carbon neutrality by 2040. The first energy savings payment is due on this loan in December 2021.

Guaranteed energy savings contracts are recommended by the State of New Mexico as a mechanism for municipalities to fund and implement sustainability projects. In consultation with the City's Bond Counsel, this project followed specific state statutory requirements for this type of project. With the unique funding, the City will be able to implement recommendations of the 25 Year Sustainability Plan to achieve carbon neutrality by 2040, stimulate recovery from the Pandemic, create local jobs, and preserve GRT bonding capacity.

The two contractors providing the guaranteed energy savings performance contract services, whose contracts are part of the energy performance package, are Yearout Energy and Dalkia Energy Solutions. Yearout was procured via the state price agreement wherein the New Mexico General Services Administration conducted an RFP and entered into contracts with approximately 5 energy services contractors. Yearout was selected based on its qualifications for design build of renewable energy systems and their local presence.

In 2015, the City of Albuquerque conducted an RFP to select a contractor to design, procure, coordinate with utility, construct and maintain the City's streetlights. Dalkia was selected through that competitive procurement based on evaluation factors of experience and past performance on projects, approach

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and plans to meet the requirements of the RFP, project schedule and ability to successfully complete the project within that schedule, and cost. The City of Albuquerque successfully completed their streetlight conversion with Dalkia as a contractor and is in the maintenance and customization phase. The City of Santa Fe can procure using existing contracts, procured by other governments in New Mexico. The alignment of scope of the procurement and contracts developed in Albuquerque with the City of Santa Fe's streetlight infrastructure needs, as well as knowing Albuquerque's recent experience with Dalkia, made procurement through an existing contract a great benefit to the City. Also, the experience that the Dalkia team gained collaborating with PNM on the City of Albuquerque's project has already been a benefit to the City of Santa Fe.

The City and Dalkia's contract included an initial lighting design, shown in the table below, that was designed to meet specifications in the CABQ RFP, City of Santa Fe Outdoor Lighting Ordinance (No. 2011-37 § 10), NMDOT Standard Specifications for Highway and Bridge Construction Section 716: Luminaires 2019 Edition, ANSI/IESNA RP-8 road lighting standard, and PRC Rate 20 Revision 16. PNM owns 2069 of the 5556 street lights in the City as shown on the map in Attachment 7. The City has entered into a contract with PNM to convert PNM owned streetlights to LEDs at the same time that the City lights are converted.

Initial Lighting Design

Roadway Type	Number of Fixtures	Percentage of Total	CCT	Input Wattage	Nominal Lumen Output	IES TM-15 Backlight, Uplight, and Glare Rating		
						Back light	Up light	Glare
Residential	3,137	58%	3000K	28	3,603	1	0	1
Local/Collector	1,578	29%	3000K	118	14,637	2	0	3
Major	697	13%	4000K	190	20,190	3	0	3

Energy Savings (kWh annually)	Estimated Lumen Output City-wide	Average Color Temperature City-wide (Kelvin)
3,296,229	49,430,602	3100 K

At and before the February 24th discussion of the Dalkia contract, the Governing Body received many public comments concerned about the color of the lights proposed for use and the impact of the color

on the City of Santa Fe's dark skies and human and wildlife health. In response, Governing Body proposed an amendment to the Dalkia contract, which Dalkia accepted, to extend the timeline for implementation of the project in order to conduct a Community Guided Lighting Design process and return to Governing Body for approval of an updated lighting design. On April 14, 2021, PNM provided the governing body a letter of commitment to implement the Community Guided Lighting Design to the best of its ability, given the constraints of being a public utility regulated by the PRC.

Since that time, City staff, Dalkia, and PNM (project team) have engaged in a robust community engagement process gathering input and providing information via email, the project website, phone, working group meetings, and physical demonstrations of streetlight fixtures. The project team has

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reviewed the input from the website, emails, and phone calls and that data is included in Attachment 3. Details of the public engagement activities and graphics of summarizing the feedback are included in the presentation (Attachment 2).

The Community Guided Lighting Design process sought to understand the community priorities in a streetlight design and gather input to lighting design preferences. Reducing light pollution, preserving dark skies, protecting wildlife and human health, conserving energy to reach carbon neutrality and promoting safety and security were the top stated priorities of the working group, emails and webforms. The community engagement indicated that the lowest possible color temperature that could achieve requirements for road lighting, energy savings, lumen reduction, and warranty should be used.

Dalkia's engineers and lighting designers analyzed equipment options at lower color temperatures and found 3000 kelvin lights that performed comparable to the 4000 kelvin lights in the original design and 2700 kelvin lights that performed comparable to the originally included 3000 kelvin lights. PNM then fast-tracked the process to have a 2700 kelvin fixture evaluated by standards, rates, and regulatory groups; add it to the company's Appendix A to Rate 20; and gained approval to install the newly listed equipment for the City of Santa Fe. The list of equipment that met project goals and requirements, including IDA guidance for a Dark Sky Community, is described in Attachment 4.

Demonstration fixtures were installed at four locations across the City featuring the fixtures from the list for residential, local, and major roadways. The project team met with the public at two of the demonstration sites at staffed events on opening night. One of the most common pieces of feedback was that the new lights had glare and seemed harsh when looking up at them. Other feedback ranged from people glad that new lights had full cutoff shielding to protect dark sky, to observations that the road and sidewalk were well lit; others thought that less light would be better.

Directly in response to community feedback, Dalkia's engineers researched equipment that could reduce glare and harshness and found a visual comfort lens option to reduce glare with additional side shielding to eliminate uplighting. The lens and side shield result in a more pleasant experience from reduced glare, while meeting dark-sky preservation requirement that no light emit above horizontal.

The recommended design is shown in the table below and in the Design Specifications Document in Attachment 7, which is what Governing Body is asked to approve tonight. The recommended design incorporates the lowest lumen output and lowest color temperature that can meet the goals and requirements of the project. According to photometric analysis, lights with higher lumens, and/or without lenses, would greatly reduce the dark zones on roads and sidewalks in the City. By contrast, the proposed lighting design improves road lighting by focusing light on the roadway, while also meeting

community feedback and International Dark Sky's Five Principles for Outdoor Lighting.

Once the design is approved by the Governing Body, amendments to the contract and financing documents will be prepared, and brought to Governing Body for approval. Preliminary equipment and installation costs and energy savings analysis of community guided recommended design by Dalkia indicate that the costs and savings in the contract will not change significantly. PNM has presented a cost estimate of \$48,860.00 to add the comfort lenses and side shields to the project equipment.

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Recommended Community Guided Lighting Design

Roadway Type	% Total Fixtures	Color Temp.	Input Wattage	Visual Comfort Lens	Nominal Lumen Output +/- 10%	IES TM-15 Backlight, Uplight, and Glare Rating		
						Back light	Uplight	Glare
Residential	58%	2700K	28-45	Yes	4,000	1	0	1
Local/ Collector	29%	3000K	90-100	Yes	8,900	2	0	2
Major/ Arterial	13%	3000K	190-200	No	20,000	3	0	3

Estimated Energy Savings (kWh annually)	Estimated Lumen Output City-wide	Average Color Temperature City-wide (Kelvin)
3,200,000	40,000,000	2,800K

Dimming strategies can be used as part of the lighting design to further enhance dark skies and reduce total lumen output and energy use. Smart controls providing dimming capability on City owned lights are included in the Dalkia contract scope and price so dimming strategies can be implemented on 63% of the City lights. PNM has not included smart controls on a municipal LED retrofit but has gained approval to offer this equipment to the City of Santa Fe.

The project improves reliability and customer service; reduces energy consumption by over 60%; reduces the overall lumen budget of the streetlights by over 50%; preserves the night sky and character of Santa Fe through zero-uplight fixtures, lowest achievable color temperatures, visual comfort lenses and side shields; and fits the city's street lighting infrastructure with smart control technology to allow for further control of lighting levels on city owned lights. The smart control technology, coupled with a dedicated maintenance contractor, brings the city a guaranteed monthly outage rate of 2% or less, routine repairs completed in 5 days or less, and monthly lighting performance and energy usage reports.

Attachments

1. Presentation
2. Community Feedback
3. Community Guided Design Equipment List (prior to comfort lens)
4. Comfort Lens Fixture Brochure
5. City Roadway Classification Map
6. Design Specification
7. Map of PNM and City Owned Lights
8. City of Albuquerque RFP