

## MEMO

**To:** Detroit City Council; Subcommittee on Public Health and Safety  
**From:** Lightstar Renewables, LLC  
**Date:** July 5, 2024  
**RE:** Locally Sited Utility-Scale Solar Project Request for Information

### **Introduction**

The City's Office of Procurement & Contracting awarded Lightstar Renewables, LLC ("Lightstar") two sites (State Fair and Gratiot-Findlay) for the Locally Sited Utility-Scale Solar Initiative. Lightstar attended the City Council's Public Health and Safety Subcommittee meeting on July 1, 2024. A series of questions were submitted by Council members as a follow-up action item from the meeting. This document serves as Lightstar's response to those questions and requests for more information.

### **Solar & Urban Heat Islands**

Lightstar provides the following studies demonstrating how solar can help mitigate the urban heat island effect:

- **“The potential for air-temperature impact from large-scale deployment of solar photovoltaic arrays in urban areas”** (*Solar Energy journal*)  
<https://www.sciencedirect.com/science/article/abs/pii/S0038092X12003386?via%3Dihub>
  - Study conducted in urban, semi urban sites around Los Angeles, California determined large-scale deployment of solar PV arrays has no adverse impact on the atmosphere.
  - Study found that for the range of solar conversion efficiencies currently available or expected to become attainable in the near future, the deployment of solar PV can cool the urban environment.

### **Agrivoltaic Impacts on Heat**

Lightstar provides the following studies demonstrating how vegetation and agrivoltaic vegetation versus bare ground or gravel helps to cool solar panels and increase efficiency of energy production:

- **“The potential for agrivoltaics to enhance solar farm cooling”** (*Applied Energy journal*)  
[The potential for agrivoltaics to enhance solar farm cooling - ScienceDirect](https://www.sciencedirect.com/science/article/abs/pii/S0959652623001000)
  - The study found that hovering solar panels over an area vegetated with soybeans would reduce panel temperatures by **10 °C compared to traditional bare ground solar farms** built over bare ground. Mainly, this was due to the light-reflecting effect of crop vegetation (70%, versus just 20% from bare ground), which cooled the ground surface and by default reduced the panels' exposure to heat.
  - Evapotranspiring vegetation also provided cooling as water droplets formed at the base of the panels.
- **“Agrivoltaics provide mutual benefits across the food–energy–water nexus in drylands”** (*nature Sustainability journal*)  
[https://www.researchgate.net/publication/335583033\\_Agrivoltaics\\_provide\\_mutual\\_benefits\\_across\\_the\\_food-energy-water\\_nexus\\_in\\_drylands](https://www.researchgate.net/publication/335583033_Agrivoltaics_provide_mutual_benefits_across_the_food-energy-water_nexus_in_drylands)



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- Study found that across the core growing season, PV panels in an agrivoltaic system were ~8.9 + 0.2°C cooler in daylight hours.

## **Solar Impacts on Public Health**

Solar modules on the market today are very safe and any crystalline silicon modules that Lightstar would utilize for the Detroit sites would meet rigorous testing and quality assurance and quality control by a third-party vendor. Lightstar provides the following studies determining that solar technologies are not known to pose any significant health dangers to neighbors:

- **“Health and Safety Impacts of Solar Photovoltaics”** (NC State University Clean Energy Center): <https://nccleantech.ncsu.edu/wp-content/uploads/2019/10/Health-and-Safety-Impacts-of-Solar-Photovoltaics-PV.pdf>
  - Major categories of public safety reviewed are (1) Hazardous Materials (2) Electromagnetic Fields (EMF) (3) Electric Shock and Arc Flash (4) Fire Safety. In each of these sections, the negative health and safety impacts of utility-scale PV development were shown to be negligible, while the public health and safety benefits of installing these facilities are significant and far outweigh any negative impacts.
  - The study determines risks of site contamination are much less than for most other industrial uses because PV technologies employ few toxic chemicals and those used are used in very small quantities.
  - Concludes there is no negative health impact from the EMF produced in a solar farm.
  - Concludes concern over solar fire hazards should be limited because only a small portion of materials in the panels are flammable, and those components cannot self-support a significant fire.
- **“Solar Panel Components: Safety”** (Penn State Extension): <https://extension.psu.edu/solar-panel-components-safety>
  - An ethylene vinyl acetate (EVA) layer applied to the glass helps keep a solar panel intact even if it is cracked like a car windshield.
  - Studies looking at panels operating under normal conditions years after installation have found that the soil under the panels did not contain dangerous levels of harmful materials. A few studies have also put cracked solar panels in the field and found no significant release of toxins into the environment. The reaction of solar panels to create electricity is a physical reaction and no liquids are contained within the modules.
- **“Facts about solar panels: PFAS contamination”** (Michigan State University): <https://graham.umich.edu/media/pubs/Facts-about-solar-panels--PFAS-contamination-47485.pdf>
  - Confirms that no studies have shown the presence or leaching of PFAS from PV panels—either while they are in active use or at the end of their life (e.g., in a landfill).

## **Grid Interconnection**

Under the terms of the contract, Lightstar will develop, construct, and operate/maintain the solar arrays at the State Fair and Gratiot Findlay sites. This will entail interconnecting the projects to the existing local DTE electric grid. Lightstar will cover costs related to grid infrastructure upgrades necessary to interconnect the amount of power that will be generated and sent to the grid, ensuring

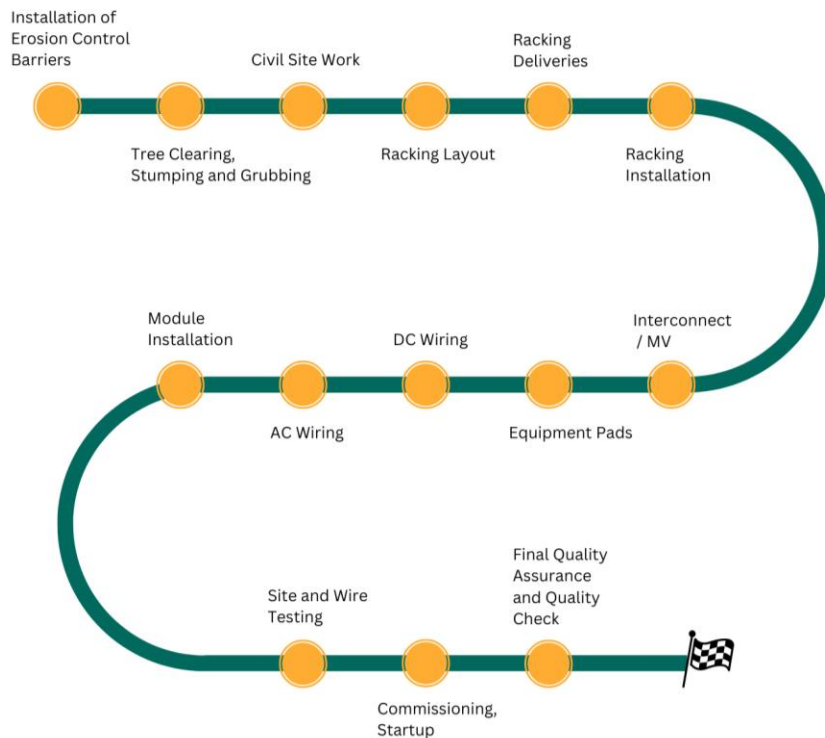


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there is adequate capacity. Energy generated will flow from the solar panels to the on-site inverters, where it is inverted from Direct Current (DC) to Alternating Current (AC). The energy then travels from project transformers into the distribution feeders to the distribution grid infrastructure. Lightstar's projects will sell the energy produced to DTE at wholesale rates and the City of Detroit will make the projects whole, up to the contract price for that energy produced. The City of Detroit will take title to Lightstar's RECs for all associated production.

## **Timeline for Construction**

As a general rule, these projects should take about 6-8 months to complete from the start of construction to going operational.



## **Neighborhood Agreement Budget**

Per the terms of the July 7, 2024, vPPA agreement, funding allocations for the Neighborhood Agreements included \$750,000 for State Fair and \$400,000 for Gratiot Findlay. This budget is intended to cover fencing, landscaping, vegetation for screening (such as trees and shrubs), and basic lighting if needed at the entrance. Options, designs, and additional requests will be reviewed and discussed with the neighborhoods during the community engagement process. A mechanism for additional funds has been built-in to the contract, meaning if the neighborhoods request items that are not included in these budgets, the pricing will be adjusted in the PPA price.

