

2024



METROPARKS
TOLEDO



PROJECT

BEACON

Workplan

CPRG Grant
Application



Climate Pollution Reduction Grants

Implementation Grants

Workplan for General Competition

1. OVERALL PROJECT SUMMARY AND APPROACH

a. Description of GHG Reduction Measures

Project Beacon is an innovative collaboration led by Metroparks Toledo that will:

- Provide a sustainable, cost-effective source of energy for a large manufacturer that will purchase the electricity while reducing carbon emissions
- Advance the community's goals for a cleaner environment
- Fund additional sustainability efforts to benefit local residents
- Make beneficial use of otherwise unusable land

Metroparks Toledo intends on installing **18.6-megawatts of solar** (PV) production capacity on two sites (81.1-acres) of former landfills in Toledo, OH, and interconnecting these to the grid through either wholesale or retail (net-metering) configurations. An estimated \$29,043,700 investment will be made into the project with a proposed request of \$9,931,000 of this total coming from the US EPA Climate Pollution Reduction Grant (CPRG). Total annual output of the solar PV facility once up and operational is estimated to be **30.08mWh** and will run for at least 26-years.

The project both constitutes an exciting step forward in our region's commitment to sustainable energy and models the kind of creative public-private partnerships that will increasingly play a central role as our communities work together to address environmental, economic and other challenges. Metroparks mission to be a leader in the conservation of natural resources includes employing sustainable practices that protect these resources in the long term. Project Beacon will advance a goal of reducing the impact of the park system's operations on the environment while generating funds to support our important conservation work.

Metroparks is well positioned to lead this effort because of its track record of convening key partners around major community improvements, and its vision to elevate our region and enhance its reputation. Metroparks has played the lead role in organizing the project and will have the primary role in ensuring it is properly funded. The Metroparks will use the resulting financial proceeds to pay for the ongoing maintenance costs associated with its transformational downtown Glass City Riverwalk project and the system-wide expansion of parks and community services that are at the heart of the Metroparks' strategic plan. Additionally, a portion of the proceeds will be placed in a fund under the control of the Metroparks Foundation for the purpose of funding grants to local non-profit organizations to help meet their operating costs, focused on energy and related expenses.

First Solar, a world leader in comprehensive solar-powered solutions, will deploy cutting-edge technology (see Equipment Data Sheets in Other Attachments) in the solar array that will be located on the capped Tyler and Dura Avenue landfills. The Dura site was the subject of long-running contentious litigation aimed at remediating environmental problems. The project site is highly visible from the



major thoroughfares in greater Toledo, particularly Interstate 75, and adjacent to Northwest Ohio's largest manufacturing employer Stellantis, owner and operator of the iconic Jeep plant. Stellantis (FCA Group) is the 4th biggest car manufacturer in the world, boasting 16 brands, 408,000 employees, and manufacturing facilities in 30 countries. The Jeep plant is Northwest Ohio's largest manufacturing employer. **Project Beacon makes a powerful statement about the region's ability to meet the challenges from its past and transform itself into a model for the future.**

The proposed project has two separate arrays, the Dura Avenue array is a 13.92 MWDC facility, and the Tyler Street array is a 7.21 MW DC facility. The total yearly electrical generation for the site is 30.08 GWh on 81.1 acres. For representative images, please see the "Maps and Photos" file included with the Other Attachments.

Variable	Tyler Landfill Array	Dura Landfill Array Value	Total
DC Nameplate	7.21 MW	13.92 MW	21.13 MW
AC Nameplate	6.00 MW	12.60 MW	18.6 MW
Annual Production	10.21 GWh	19.87 GWh	30.08 GWh
Area	28.70 acres	52.41 acres	81.1 acres



Figure 1: Project Beacon Project Area



Tyler Street Landfill was in operation from the early 1950s to the early 1970s. It was owned and operated during that time by the City of Toledo to dispose of municipal wastes. In 1999, Tyler Landfill was closed using a Geomembrane cover. A declaration of restrictive covenants was made in March 2003 by the U.S. EPA. Dura Avenue Landfill was in operation from 1952 to 1980. It was owned and operated during that time by the City of Toledo to dispose of municipal wastes but accepted industrial and commercial wastes until 1968. Closure activities began in the early 1980s. A Remedial Action began in 1999 and a Construction Completion Report was accepted by the Ohio EPA in 2002.

As noted in the Solar Feasibility Analysis which was developed for this project, if the proper design, notification, and approval for the development are applied, development of a photovoltaic (PV) system is feasible. For the Dura landfill, the Consent Order issued in October 1999 includes requirements/restrictions regarding the Deed notice, Land Use and Conveyance of Title that will be considered by Project Beacon. If the prescribed notification and arrangements are established prior to any development, the facility should maintain compliance with the agreement although legal review of such an approach may be merited. For the Tyler landfill, the Restrictive Covenant includes covenants, conditions, and restrictions (collectively, the “Covenants”) that apply to the use of the property. Except with written approval of U.S. EPA, the Grantor must not permit any activity on the property that could interfere with, damage, or otherwise impair the effectiveness of the Removal Action.

Additionally, the Grantor must not permit a commercial, recreational, industrial or agricultural use of the Properties which the Grantees reasonably deem will interfere with the Removal Action or will expose humans or animals to unacceptable risks or hazards, including, but not limited to, impeding surface water drainage, piercing the Containment System, blocking gas vents, or construction which will induce short- or long-term settlement; provided, however, that Grantor may permit commercial, recreational, industrial or agricultural use of the Properties that Grantees reasonably deem, in writing, will not interfere with the Removal Action or expose humans or animals to unacceptable risks or hazards. Grantor must timely present specific plans to Grantees allowing each of them to challenge the demonstration that such proposed use is permitted.

Both of these landfills are closed and have agreements and obligations requiring ongoing monitoring and maintenance requirements and a mandate to maintain the integrity of the remedial actions that have been completed. Such features include: the engineered landfill cover system, vegetation, groundwater and leachate monitoring systems, grading and stormwater conveyances, access roads, security, leachate management systems, landfill gas monitoring/management systems, etc. Project Beacon will honor the measures in-place to maintain the integrity of, and access to, these components. If such measures are set in-place, and the PV system is designed in a manner that the landfill cover system is not compromised, completion of the project should be able to advance. Notification will be made to the assigned Site Coordinators prior to completing work activities as a professional courtesy and/or as required if construction may impact engineered or environmental controls.

Typically, landfills like these that have undergone remedial actions under agreements and implemented operations and maintenance and monitoring programs stabilize over time with the risk of future, required site improvement activities to diminish over time. There are variables that need to be considered for different types of landfills based upon the age and type of the materials originally placed in the landfill. Settlement and slope stability should be considered with the PV system design, along with other variables and setbacks from site engineering and environmental systems. Our current understanding of both landfills indicate they are relatively stable and that there is no definitive information available indicating that either site would require any type of significant engineering or



environmental improvements over time should the PV system be developed on the properties, although this cannot be guaranteed. Limited maintenance activities (erosion repairs, mowing, road maintenance, etc.) may be required on the facility based on the findings of site inspections regardless of whether a PV system is developed or not.

A short-term risk associated with this proposed solar facility is connecting it to the grid in a timely fashion. As such, coordination with the local electric utility (FirstEnergy/Toledo Edison) will be important at the very beginning of the planning stages. Longer term risks are associated with weather patterns in the Mid-West. Tornadoes, hail, lightning, and freezing rain/ice all hold potential to inhibit electric production from the facility, either temporarily or catastrophically.

The PV System layout was modeled using PlantPredict to show conceptual PV design and simulate resulting electricity generation. The design assumes a perimeter fence would be erected 10 feet away from the array. DC/AC inversion will occur on the south, west, and north sides of the Dura array along the existing access road, and the north and south sides of the Tyler array along the existing access road. To avoid disturbing the landfill caps, the array will be mounted on a ballasted racking system (see Equipment Data Sheets in Other Attachments). System wiring will be within the racking system and overhead cabling. Tree clearing will be necessary on the north side of the Tyler Road Landfill array, all other trees were designed around to minimize tree clearing.

The Ohio Environmental Protection Agency (Ohio EPA) produced the Ohio Priority Resiliency Plan¹ (the Plan) with a CPRG planning grant in early 2024 to support investment in policies, practices, and technologies that reduce GHG emissions across the state. The Plan is identified GHG reduction measures that reflect the priorities and concerns of different Ohio communities, while achieving a broader goal to reduce aggregate emissions produced in the state. This Plan laid the foundation for the next steps of Ohio's CPRG program.

Considering both gross and net emission, the three sectors contributing the most to GHG emissions in Ohio are electric power, buildings, and transportation. Clean energy, including renewables, currently represent a small percentage of Ohio's total electricity generation (16%), indicating there is significant opportunity for Ohio to maximize the use of clean energy to decarbonize its power generation. **The installation of the 2 solar arrays as part of Project Beacon is the proposed GHG reduction measure.**

As noted in the Plan, Priority Reduction Measure #4 is **Renewable electricity generation**. This was a priority measure for the State of Ohio and Constituents. These measures were identified as those most suitable for near-term implementation by other Ohio constituents, potentially in partnership with the State. The Plan encourages initiatives like Project Beacon that include:

- Increase the use of renewable energy, such as solar and wind, to produce electricity in Ohio
- Reduction in co-pollutants and improved health outcomes
- Reduction in energy costs and therefore energy burden
- Employment opportunities for the construction, installation, and maintenance of renewable energy installations
- Solar-focused distributed energy and utility-scale solar are complementary approaches to harnessing solar power for electricity generation. Distributed solar energy involves installing small-scale photovoltaic (PV) systems, typically on rooftops or ground-mounted systems

¹ <https://epa.ohio.gov/divisions-and-offices/directors-office/climate-pollution-reduction-grant-program>



b. Demonstration of Funding Need

Founded in 1928, Metroparks Toledo protects our community's natural resources by using public dollars responsibly to conserve, preserve and restore areas that provide remarkable environmental and economic value for all of northwest Ohio. Parks and open space benefit the community by helping clean the air and water, retain stormwater, provide essential habitat for wildlife and enhance property values. Metroparks Toledo currently manages 19 parks, along with regional trails and special use areas, in Northwest Ohio. Much of the access to nature Lucas County residents enjoy is provided through Metroparks, and ever since 2020, there is now a Metropark within 5 miles of every Lucas County resident.

The vision of Metroparks Toledo is that it will be, in its culture and community engagements, the **beacon** for conservation of natural resources; diversity, equity, and inclusion; and the activation and promotion of spaces that enhance physical and mental health. The communal pursuit of these aspirations will elevate our region and transform its identity.

Project Beacon resonates with the mission and vision of Metroparks by repurposing over 80 acres of unproductive land, reducing the region's carbon emissions, and creating enough green solar energy to power 1,800 homes annually; all while generating income to help cover the costs of preserving and maintaining the parks and natural areas to a high standard of care that the community and visitors have come to expect from Metroparks.

Project Beacon is seeking implementation funding through the CPRG program in order to support funding needs that are unmet by other funding sources. We anticipate utilizing the Inflation Reduction Act (IRA) passed by Congress in 2022 to provide up to 50% of the construction cost in the form of a federal payment after the array is placed into service. The brownfield project is located in a distressed zip code, will utilize American made panels and Balance of Systems, and pay prevailing wages. All these items are expressly referenced in the federal legislation and long-standing supporter of Metroparks, Congresswoman Marcy Kaptur has encouraged the project to apply for the Inflation Reduction Act funds.

In addition to this CPRG request, we are seeking funding through multiple sources. We recently submitted a Congressionally Directed Spending (CDS) request through the office of Senator Sherrod Brown. We are planning a grant request to the Department of Energy through the Communities Sparking Investment in Transformative Energy² (C-SITE) program. We also continue to have conversations with the National Renewable Energy Laboratory through their Expert Match to identify other possible funding sources. Finally, we have had initial conversations with Local Initiatives Support Corporation (LISC) about their potential support through the National Clean Investment Fund³. The local LISC office has provided a letter of support for this project which is included as an attachment.

The measures contained in the Ohio Priority Resiliency Plan were intended to be available to any entity in the state eligible for receiving funding under the U.S. EPA's Climate Pollution Reduction Implementation Grant (CPRG) and other funding streams, as applicable. Metroparks Toledo is an eligible

² <https://www.energy.gov/articles/biden-harris-administration-announces-18-million-transformative-clean-energy-projects-led>

³ <https://www.epa.gov/greenhouse-gas-reduction-fund/national-clean-investment-fund>



entity to apply for CPRG funding and is providing a letter in the attachments with the appropriate legal opinion⁴.

While preparing this application, Metroparks reached out to the State of Ohio regarding their CPRG application to see if there was a possibility for collaboration. The program they are proposing focuses on fleet modernization for state agencies and counties/municipalities as well as buildings emissions including energy efficiency upgrades and onsite renewable energy installation for state/county/municipalities. While supportive of Project Beacon, they encouraged Metroparks to apply separately and quote the appropriate measure in the State Plan in our application. We believe Project Beacon to be a nice complementary implementation project alongside the suite of state-led transportation and building-focused projects.

c. Transformative Impact

Project Beacon is a sustainability win for the entire community, incorporating:

- Savings for industry
- A cleaner environment for the community
- Funding to further additional sustainability goals
- A beneficial reuse of landfills

Metroparks Toledo has rapidly become one of the best park systems in America, providing tremendous benefits to the community. Great communities have great parks and we were honored that our work was acknowledged with the 2020 National Gold Medal Award⁵. That award reflects a broad national recognition of our great parks, and it spreads the word about the kind of place we as a community have created. Project Beacon is a cooperative effort lead by Metroparks, a regional leader in sustainability that helps the agency and the region achieve their sustainability goals. ***It is timely because the need, opportunity, and partners are aligned today***

The Metroparks Toledo Foundation currently holds the lease on the Dura and Tyler sites discussed previously from the City of Toledo for up to 50 years. The lease was approved by Toledo City Council and Mayor Wade Kapszukiewicz in August 2023. According to Mayor Kapszukiewicz, “when I learned a partnership was forming to reduce our reliance on traditional energy sources to power local industry and jobs, I thought there simply couldn’t be a better use for the former Dura and Tyler landfills. The high visibility location would show everyone who drives through our city that we are serious about and leading the way to a greener tomorrow. And there isn’t a better convener of projects to elevate our region than Metroparks Toledo.” The City of Toledo provided a letter of support for Project Beacon included in the Other Attachments.

Project Beacon will be one of the largest arrays in Ohio constructed on a brownfield. The project will help fund conservation work for generations to come and create the nation’s first carbon-neutral park district in the country since it is the intention of Metroparks Toledo to retire a portion of the solar energy credits associated with constructing a solar array of this magnitude. Project Beacon is harnessing nature and improving the environment.

⁴ See attached letter in Other Attachments from Marshall & Melhorn

⁵ <https://www.nrpa.org/our-work/awards/goldmedal/>



Verdantas⁶, formerly Hull & Associates, have provided engineering estimates for the project and are providing consulting services for necessary permitting through the US EPA and Ohio EPA. The engineering estimates have been confirmed by CS Energy⁷, formerly Conti Construction Company that has constructed over 40 solar arrays on brownfield sites throughout the United States, including the Brooklyn landfill in Cuyahoga County.

Ongoing operations and maintenance will be contracted through Palmer Energy⁸. We are confident that a market-based Power Purchase Agreement will provide a reliable stream of cash flow that will cover the annual maintenance costs and expenses associated with long-term permanent financing of the project. The success of this project will further enable Metroparks to support underserved portions of our community.

Given the Jeep plant is contiguous to the Dura and Tyler sites, we strongly believe that Stellantis is the highest likely buyer for the green energy as it aligns with their current primary corporate goal of producing cars in a manner that can protect the environment in terms of pollutions such as carbon and is virtually an “on-site” source of energy. The project allows Stellantis to support its Dare Forward 2030 initiative to achieve carbon net zero by 2038.

First Solar has agreed to produce its cutting-edge Series 6 panels for the array during the second quarter of 2024. According to Mark Widmar, CEO of First Solar, “this kind of innovative thinking is a game-changer for our region...Given our deep investment and significant employment in the region, we knew we had to figure out a way to participate, particularly when proceeds from the arrays will go to keeping our Metroparks maintained to their award-winning standards well into the foreseeable future.”

2. IMPACT OF GHG REDUCTION MEASURES

In January 2022, a Solar Feasibility Analysis was prepared by Hull & Associates for the Dura and Tyler landfills. The evaluation in the Solar Feasibility Analysis is for a behind-the-meter (BTM) facility and included a preliminary critical issues analysis (CIA), a conceptual site layout, and a project cost estimate. The preliminary CIA is an early-stage analysis of major factors that determine site suitability for solar and potential energy storage development, and a guide for further review. The conceptual site layout and solar energy assessment identified total solar energy capacity in AC and DC and a figure showing layout and orientation of the solar arrays.

PlantPredict⁹, was used to develop site-specific PV production models and estimate site energy generation. PlantPredict uses equipment specifications, array orientation and tilt, user-identified obstacle shading, topography, and local weather data to provide energy generation models.

⁶ <https://www.verdantas.com/>

⁷ <https://www.csenergy.com/>

⁸ <http://www.palmerenergy.com/>

⁹ PlantPredict, Online Solar Energy Model, Terabase Energy, Version 9.0.0.



a. Magnitude of GHG Reductions from 2025 through 2030

Project Aggregate Emissions Reductions/Offsets by Geography 2025-2030

Pollutant	Mid-Atlantic Region (PJM)	State of Ohio	Toledo MSA	Lucas County
SO2 (tons)	65.47	23.79	.02	.01
NOX (tons)	58.19	15.27	.37	.04
CO2 (tons)	150,844	30,498	2,140	938
PM2.5 (tons)	8.67	1.65	.10	.03
VOCs (tons)	2.08	.33	.006	.002
NH3 (tons)	2.83	.76	.102	.038
CH4 – coal (tons)	.32	not available	not available	not available
CH4 – gas (tons)	.01	not available	not available	not available

As described on the cover page, the estimated cumulative GHG reductions for 2025-2030 (in metric tons) is 150,981. FirstEnergy/Toledo Edison is tapped directly into the Mid-Atlantic Region grid's electronic generation portfolio, so reducing/offsetting within this geography will make a significant impact.

b. Magnitude of GHG Reductions from 2025 through 2050

Project Aggregate Emissions Reductions/Offsets by Geography 2025-2050

Pollutant	Mid-Atlantic Region (PJM)	State of Ohio	Toledo MSA	Lucas County
SO2 (tons)	265.58	96.51	.04	.02
NOX (tons)	236.05	61.95	1.54	.18
CO2 (tons)	611,925	123,720	8,682	3,805
PM2.5 (tons)	35.15	6.71	.41	.12
VOCs (tons)	8.42	1.33	.03	.01
NH3 (tons)	11.49	3.06	.41	.16
CH4 – coal (tons)	1.31	not available	not available	not available
CH4 – gas (tons)	.03	not available	not available	not available

As described on the cover page, the estimated cumulative GHG reductions for 2025-2050 (in metric tons) is 612,483. FirstEnergy/Toledo Edison is tapped directly into the Mid-Atlantic Region grid's electronic generation portfolio, so reducing/offsetting within this geography will make a significant impact.



c. Cost Effectiveness of GHG Reductions

Cost of Effectiveness (per unit of pollutant) of Reducing Emissions by Geography 2025-2050

Pollutant	Mid-Atlantic Region (PJM)	State of Ohio	Toledo MSA	Lucas County
SO2 (ton)	\$152K	\$417K	\$916 million	\$1.9 billion
NOX (ton)	\$171K	\$650K	\$26 million	\$229 million
CO2 (ton)	\$66	\$326	\$4,640	\$10,587
PM2.5 (ton)	\$1.1 million	\$6 million	\$98 million	\$326 million
VOCs (ton)	\$4.8 million	\$30 million	\$1.8 billion	\$5.9 billion
NH3 (ton)	\$3.5 million	\$13 million	\$97 million	\$260 million
CH4 – coal (ton)	\$31 million	not available	not available	not available
CH4 – gas (ton)	\$993 million	not available	not available	not available

***NOTE: based on a total estimated contribution of \$9,931,000 from US EPA CPRG program into the solar PV project.**

Cost of Effectiveness (per unit of pollutant) of Reducing Emissions by Geography 2025-2050

Pollutant	Mid-Atlantic Region (PJM)	State of Ohio	Toledo MSA	Lucas County
SO2 (ton)	\$444K	\$1.2 million	\$2.7 billion	\$5.7 billion
NOX (ton)	\$499K	\$1.9 million	\$77 million	\$670 million
CO2 (ton)	\$193	\$952	\$13,570	\$30,963
PM2.5 (ton)	\$3.5 million	\$18 million	\$287 million	\$954 million
VOCs (ton)	\$14 million	\$88 million	\$5.3 billion	\$17.4 billion
NH3 (ton)	\$10 million	\$38 million	\$283 million	\$762 million
CH4 – coal (ton)	\$91 million	not available	not available	not available
CH4 – gas (ton)	\$2.9 billion	not available	not available	not available

***NOTE: based on a total estimated \$29,043,700 project investment into the solar PV project.**

d. Documentation of GHG Reduction Assumptions

For this CPRG grant application, Hans Rosebrock, Director, Power Energy Services & Project Manager with The Mannik & Smith Group, performed three-emission reduction/offset analyses using U.S. EPA AVERT (AVoided Emissions and geneRation Tool) modeling software.

- Annual Analysis
- 6-year (2025-2030) Analysis
- 26-year (2025-2050) Analysis

The following GHG Reduction Assumptions were part of the analysis:

- For the 6-year and 26-year analyses, data was extrapolated from the initial AVERT annual analysis.
- For methane (CH4) emissions, which is not part of the AVERT model, an annual calculation was performed by using various data sources which included; the US EPA, US Energy Information Administration, Global Energy Monitor, and Boston University's Institute for Global Sustainability. The calculation is based on methane emitted into the atmosphere from US coal



mining activities and natural gas transmission & distribution. The total annual emission offset was derived from establishing coal and natural gas inputs needed to produce one megawatt hour (mWh) of electricity, corresponding ratio of methane released (in metric tons) into the atmosphere from the mining and distribution of these fossil fuels, and the percentage of coal and natural gas electric generation in the Mid-Atlantic (PJM) Region.

- Emissions of hydrofluorocarbons, nitrous oxide, perfluorocarbons, and sulfur hexafluoride were not included based on that fact these chemicals are generally not considered an underlying pollution problem in grid scale electric generation.
- For extrapolated data findings, no future electric generation plant starts or closures are accounted for.
- For extrapolated data findings, an annual reduction or degradation factor of .3% was used in the calculations based on the performance characteristics of First Solar Series 6 PV panels that will be installed.
- Geographies in the analyses are based on where the proposed solar project will be sited (Toledo, OH), in which the local utility (FirstEnergy/Toledo Edison) is within the electric generation boundary portfolios of:
 - Mid-Atlantic Region (PJM RTO),
 - State of Ohio,
 - Toledo MSA (Fulton, Lucas, & Wood Counties), and
 - Lucas County

Please see the GHG emission reduction calculation spreadsheet in the Project Narrative attachments for additional detail.

3. ENVIRONMENTAL RESULTS – OUTPUTS, OUTCOMES, AND PERFORMANCE MEASURES

a. Expected Outputs and Outcomes

Project Beacon supports the FY 2022-2026 EPA Strategic Plan which specifically includes new strategic goals on addressing climate change and environmental justice. This project supports:

- Goal 1, Tackle the Climate Crisis; Objective 1.1, Reduce Emissions that Cause Climate Change
- Goal 4: Ensure Clean and Healthy Air for All Communities; Objective 4.1: Improve Air Quality and Reduce Localized Pollution and Health Impacts
- Goal 6: Safeguard and Revitalize Communities; Objective 6.1: Clean Up and Restore Land for Productive Uses and Healthy Communities

Both the Dura and Tyler landfills are closed with almost no other available uses. This solar project is located in a distressed zip code (43608), will utilize American made panels and Balance of System (BOS), and pay prevailing wages. Project representatives have been in regular contact with area labor leaders and intend to sign a Project-Labor Agreement to ensure prevailing wages are earned during construction and that an approved apprenticeship program operates during construction

As a result of this project, aggregate emissions reductions/offsets by geography, from 2025 to 2050, will be:



Pollutant	Mid-Atlantic Region (PJM)	State of Ohio	Toledo MSA	Lucas County
SO2 (tons)	265.58	96.51	.04	.02
NOX (tons)	236.05	61.95	1.54	.18
CO2 (tons)	611,925	123,720	8,682	3,805
PM2.5 (tons)	35.15	6.71	.41	.12
VOCs (tons)	8.42	1.33	.03	.01
NH3 (tons)	11.49	3.06	.41	.16
CH4 – coal (tons)	1.31	not available	not available	not available
CH4 – gas (tons)	.03	not available	not available	not available

b. Performance Measures and Plan

Based on the fact that this solar PV project will be connected to the grid, real time metered electric data will be measured throughout the life of the facility and documented on a monthly basis. Actual production of electric energy will be able to be compared to estimates made.

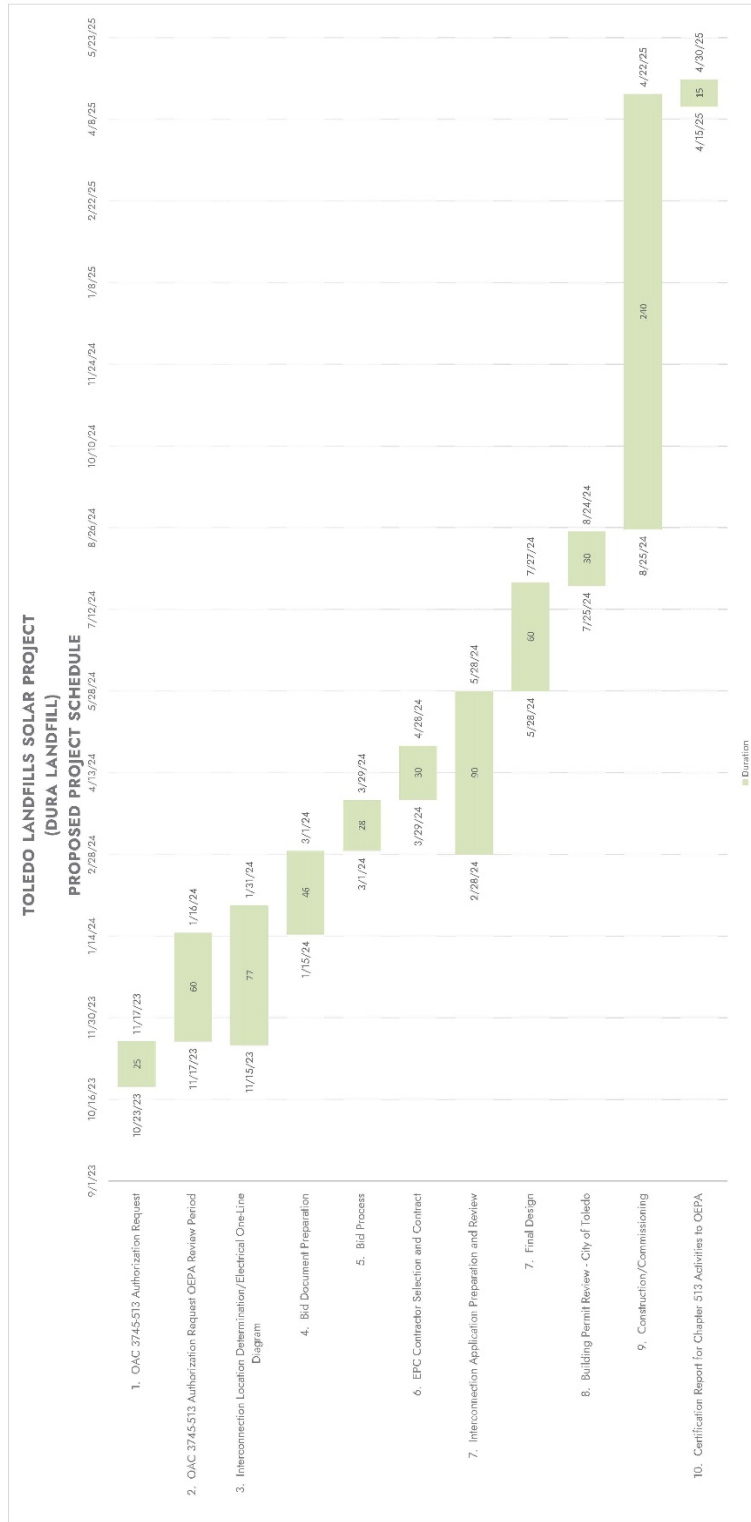
c. Authorities, Implementation Timeline, and Milestones

Project Beacon is well positioned and ready to finalize design and permitting and begin construction. The proposed timeline for the remainder of 2024, acknowledging the estimated start date for the CPRG awards being October 1, 2024. This timeline includes the preparation of bid documents, selecting the engineering, procurement, and construction (EPC) contractor, interconnection application preparation and review, and building permit review.

The proposed project schedule, shown in further detail on the next page and included in the attachments, is contingent on the approval from Ohio EPA for the construction of the phase 1 array on the Dura site and then the US EPA approval for the construction on the phase 2 array on the Tyler site. Preliminary conversations with both state and federal EPA have already been initiated.

Verdantas, formerly Hull & Associates, provided engineering estimates for the project and are providing consulting services for necessary permitting through the US Environmental Protection Agency and the State of Ohio EPA. Verdantas has a long-running and detailed understanding of the Dura and Tyler sites. Novogradac & Company, is preparing detailed pro-formas based on financing plans and the terms of any Power Purchase Agreements that are being negotiated. Ongoing Operations and maintenance will be contracted through Palmer Energy. Mark Frye, owner and CEO of Palmer Energy has provided extensive consulting and will take the lead on negotiating a Power Purchase Agreement for the array's energy output. Extensive proprietary modeling has been provided by Mark and his team and we are confident that a market-based Power Purchase Agreement will provide a reliable stream of cash flow that will cover the annual maintenance costs and expenses associated with long-term permanent financing of the project.

As noted later in Section 6, Metroparks Toledo has extensive experience with federal grants, including U.S. EPA, and is both familiar with, and prepared to complete, all necessary quality assurance project plans and semi-annual and final reports. The proposed schedule calls for completing the array and placing it into service in 2025. This schedule is also included in the optional Other Attachments.



*** Conceptual Project Schedule Notes:**

1. OAC 3745513 Authorization Request - Includes narrative, letters of intent, and support drawings. Excludes any revisions as a result of OEPA Review.
2. OAC 3745513 Authorization Request OAC Review Period - assumed duration of 45-60 days. Authorization required prior to any construction activities.
3. Certification Report for Chapter 513 Activities - Certification report to be submitted to the OEPA not later than sixty (60) days after completion of Chapter 513 activities.
4. The schedule is dependent on coordination of the interconnection location with the utility and Stollants prior to the Bid Document Preparation.
5. The final design and construction durations are dependent on the selected EPC contractor's schedule.

DRAFT



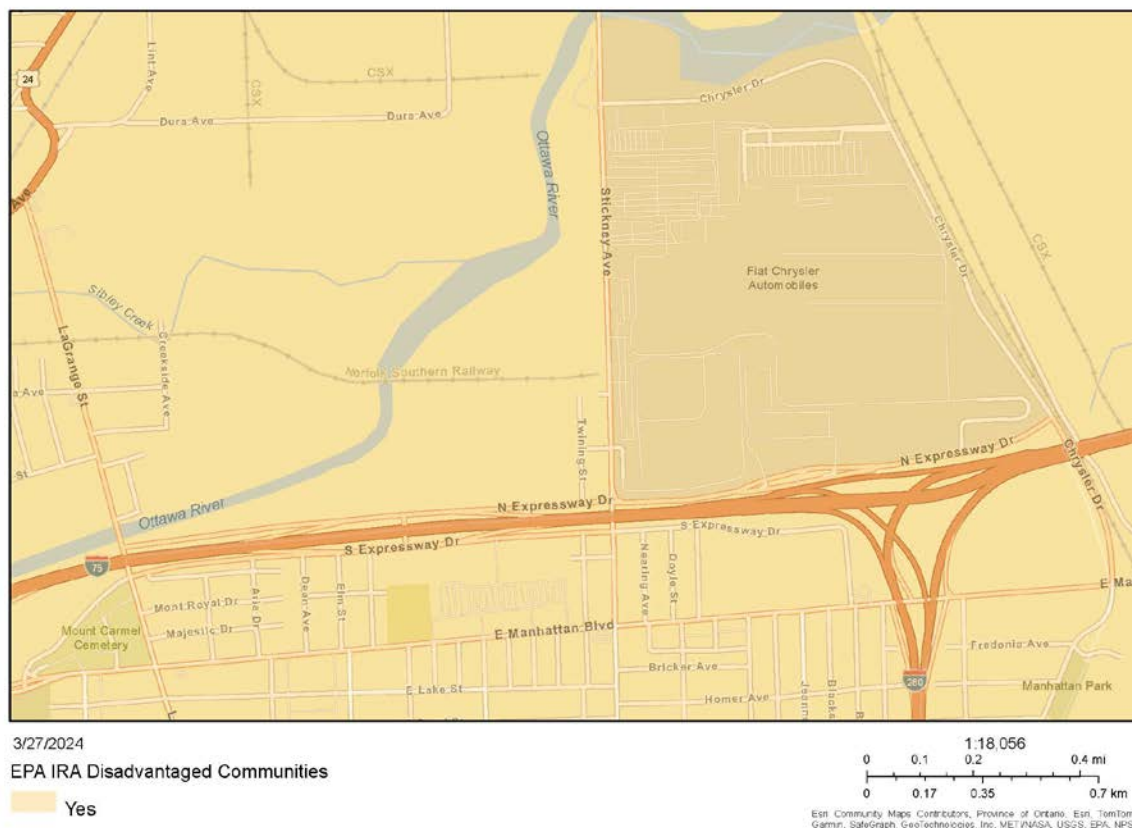


4. LOW-INCOME AND DISADVANTAGED COMMUNITIES

a. Community Benefits

As noted in the Ohio Priority Resiliency Plan, Ohio EPA expects implementation of to provide benefits to low-income and disadvantaged communities (LIDACs). Through review of LIDACs across Ohio, and with input from stakeholders on challenges faced in these communities, they addressed the potential benefits and impacts for each of the proposed priority GHG reduction measures in these areas.

Project Beacon: CEJST/EJScreen



The implementation of the measures included in the Ohio Plan are anticipated to provide benefits to LIDACs. These communities are identified as LIDACs based on the definitions, thresholds and methodology employed in the Climate and Economic Justice Screening Tool (CEJST). A census tract is identified as a LIDAC if it is above the threshold of one or more environmental, climate, or other burdens, as well as also being above the threshold for an associated socioeconomic burden.

Figure 21 on page 66 in the Ohio Plan shows the LIDAC census tracts in the Northwest Ohio. There are a few scattered throughout the area, but they mainly cluster around the city of Toledo, located in Lucas County. Energy burden appears to be the biggest factor affecting the LIDACs in this area, with the average percentile being 26 points over that of the state's average (Figure 22 on page 67). An important observation is that 55% of the census tracts in Lucas County have a low-income population, which exceeds the state average by 16%.



Figure 22 on page 67 in the Ohio Plan displays the environmental pollutant average percentiles of the LIDAC census tracts in Northwest Ohio versus all the census tracts across the state. The chart shows five of the seven environmental pollutants in the northwest region being higher than the state's averages; energy burden has the largest gap of 26 points while the rest of the variables are within 15 points of the state average.

All of the census tracts around Project Beacon are both Areas of Persistent Poverty (APP) and Historically Disadvantaged Communities (HDC). The work of Metroparks Toledo in the last five years when planning for the Glass City Riverwalk have brought new focus and attention and investments to underinvested neighborhoods. The project area is located in Lucas County Census Tracts **390950009**, **390950010**, and **390950011**. See the "Areas" Excel document in the Other Attachments for further detail.

Project Area Demographics

	CT 09	CT 10	CT 11
Population	1,879	4,271	2,215
Unemployment (percent) (percentile)	98	96	96
Share of people in households where income is at or below 100% of the Federal poverty level (percentile)	92	93	91

CEJST: <https://screeningtool.geoplatform.gov/en/>

Additionally, all of the census tracts surrounding the Glass City Riverwalk, are designated as APPs and HDCs by the White House Council on Environmental Quality's Climate and Economic Justice Screening Tool. Our environmental vision for the Riverwalk is to adhere to conservation principles to create a climate resilient landscape using nature-based solutions in Areas of Persistent Poverty (APP) and Historically Disadvantaged Communities (HDC) disproportionately impacted by climate change, pollution, and environmental hazards in alignment with the Justice40 Initiative. By planting trees and planting pollinator-friendly habitat, restoring natural areas, creating bioswales, and wetlands to improve the quality of our natural water source, the Riverwalk will have significant local and regional impact on the health residents in these communities and the health of the Maumee River.

The expected users of the Riverwalk includes representation from the 35,000 residents within a mile of the project area, the over 25,000 people who work in downtown Toledo, and of course visitors to the area. Income generated by Project Beacon will go back directly to Metroparks Toledo to support the ongoing maintenance of transformational initiatives like the Glass City Riverwalk.

The annual production of the solar array will be one performance metric along with the associated benefits. These results can be shared with the community through various social media channels, annual reports, and also the *Sustaining Our World Series*¹⁰. Each year, this series brings a discussion related to significance of both our global environment and northwest Ohio's natural resources, the importance of protecting and restoring ecosystems and ways the community can make a positive difference for the environment. The goal is to generate awareness and conversation on important topics related to conservation and sustainability. The series is sponsored by Dana Incorporated, a global leader in drivetrain and e-Propulsion systems.

¹⁰ <https://metroparkstoledo.com/learn-and-play/sustaining-our-world-speaker-series/>



b. Community Engagement

Ohio EPA created an engagement plan for seeking feedback on community priorities during development of the Ohio Plan. Receiving community inputs are invaluable to the success of this Plan as they provide insights on learnings from past successes and current initiatives, as well as strategies to overcome barriers and provide meaningful benefits. These inputs have been considered for the GHG reduction measures and LIDAC considerations in this Plan and will continue to be a key strategic component for the CRP.

Project Beacon plans to build on the community engagement that started with the creation of the Ohio Priority Resiliency Plan. Due to the sensitive nature of the project when negotiating the Power Purchase Agreement, the typical community engagement that Metroparks Toledo would engage in was not possible. Metroparks plans to leverage the deep network of community relationships we cultivated while planning for Glass City Metropark and the Glass City Riverwalk to ensure that community needs continue to guide the implementation of this project throughout design and construction. This will likely include focus-group engagements, individual stakeholder meetings, and public information sessions to shape the project. Project Beacon will strive to have robust engagement with community members throughout the development and implementation of the GHG reduction measures, and is prepared to report on the outcome of this community engagement as part of the project.

Metroparks Toledo is also participating in the Greater Toledo Community Foundation's (GTCF) Sustainable Communities Educational Initiative which leverages the two recently constructed Overland Solar Arrays to launch a diverse collection of educational activities designed to promote the intersection between workforce development, renewable energy and community activism in order to showcase emerging avenues for greater prosperity in communities that have experienced historic disinvestment. In addition to educational programming focused on employment in the clean energy and advanced manufacturing fields, the project will also activate storytelling approaches to explain sustainable energy's role in philanthropy, grant making and resident-led neighborhood enhancements.

This Sustainable Communities Educational Initiative is a Congressionally Directed Project from the Department of Energy and we plan to apply whatever best practices are developed from that solar project to Project Beacon.

Letters of support for Project Beacon are included in the attachments. These letters were prepared as part of a Congressionally Directed Spending request for Project Beacon to U.S. Senator Sherrod Brown's office that was submitted in March 2024. There are letters from the City of Toledo, Northwest Ohio Building Trades, Owens Corning, LISC Toledo, and the Toledo Lucas County Port Authority.

5. JOB QUALITY

With Project Beacon, there will be construction jobs in the short-term and also induced jobs within the supply chain and related services. The potential job creation is estimated by the Jobs and Economic Development Impacts (JEDI) model established by the National Renewable Energy Laboratory (NREL).

The following are some estimates based on a 250 MW solar project which provides a good level of comparison to Project Beacon.



Project Development and Onsite Labor Estimates

Construction Labor	441.9 FTE
Construction Related Services	23.9 FTE
Construction Total	465.8 FTE
Module and Supply Chain Impacts	100.2 FTE
Induced Impacts	107.8 FTE
Overall Total (including Construction)	673.8 FTE

Annual Operation probably results in another 14.5 FTE with onsite labor, revenue and supply chain impacts, and induced impacts.

Project Beacon representatives have been in regular contact with area labor leaders to ensure high labor standards and intend to sign a **Project Labor Agreement** (PLA) to ensure prevailing wages are earned during construction and that an approved apprenticeship program operates during construction. Northwest Ohio Building & Construction Trades Council is an advocate of this project and have provided a support letter which is included in this application.

6. PROGRAMMATIC CAPABILITY AND PAST PERFORMANCE

a. Past Performance

The following are five federally funded projects that Metroparks Toledo is performing or has performed within the last three years.

Project #1

Project Title: Audubon State Nature Preserve Islands Restoration

Assistance Agreement Number: 00E03189

Federal Agency and Assistance Listing Number: EPA 66.469 - Great Lakes Program

Brief Description: Metroparks Toledo received \$3.6 million to develop project engineering designs and implement restoration activities that will protect and enhance islands in the Audubon Islands State Nature Preserve in the mainstem of the Maumee River in the Maumee River Area of Concern.

Contact: Eric Hall, U.S. Environmental Protection Agency, 312-886-7258, HALL.ERIC@EPA.GOV

Audubon State Nature Preserve Islands Restoration project is currently on schedule.

Project #2

Project Title: Blue Creek Restoration at Blue Creek Metropark and Neis Ditch Stream Restoration

Assistance Agreement Number: 00E03190

Federal Agency and Assistance Listing Number: EPA 66.469 - Great Lakes Program

Brief Description: Metroparks Toledo received \$950,000 for bank stabilization and floodplain expansion within an existing agricultural field followed by riparian forest restoration; as well as selective bank stabilization along an additional 1,500 linear feet of naturally vegetated ditch.

Contact: Eric Hall, U.S. Environmental Protection Agency, 312-886-7258, HALL.ERIC@EPA.GOV

Blue Creek Restoration at Blue Creek Metropark and Neis Ditch Stream Restoration project is currently on schedule.

*Project #3*

Project Title: Secor Metropark Prairie Ditch

Assistance Agreement Number: 00E03017

Federal Agency and Assistance Listing Number: EPA 66.469 - Great Lakes Program

Brief Description: Metroparks Toledo received \$310,000 for a restoration project that improved degraded stream benthic communities and fish habitat through selective stream improvements along Prairie Ditch within Secor Metropark. Stream improvements included floodplain expansion, creation of streamside wetlands within the floodplain, riffle construction, and selective planting of native trees, shrubs, and herbaceous plants.

Contact: Eric Hall, U.S. Environmental Protection Agency, 312-886-7258, HALL.ERIC@EPA.GOV

Secor Metropark Prairie Ditch project was successfully completed on schedule and met all project deliverables.

Project #4

Project Title: Glass City Riverwalk

Assistance Agreement Number: PID 114239

Federal Agency and Assistance Listing Number: DOT 20.933 -- National Infrastructure Investments

Brief Description: Metroparks Toledo received \$23.6 million for the Glass City Riverwalk project which will connect six neighborhoods on both sides of the Maumee River through over 5 miles of shared-use paths. When complete, the project will improve access to and from riverfront destinations and provide reliable safe and accessible transportation options as well as contribute to ongoing revitalization of downtown Toledo.

Contact: Stuart Hembree, U.S. Department of Transportation, (614) 280-6894, stuart.hembree@dot.gov

Glass City Riverwalk project is currently on schedule.

Project #5

Project Title: Downtown Waterfront Metropark Development

Assistance Agreement Number: P21AP11646, Subrecipient Agreement 39-01482

Federal Agency and Assistance Listing Number: U.S Department of Interior, 15.916 Outdoor Recreation Acquisition, Development and Planning

Brief Description: Metroparks Toledo received \$750,000 to construct an adventure boardwalk and share-used paths with habitat and shoreline restoration at Glass City Metropark.

Contact: Tim Robinson, Ohio Department of Natural Resources, 614-265-6528, timothy.robinson@dnr.ohio.gov

Downtown Waterfront Metropark Development project was successfully completed on schedule and met all project deliverables.

b. Reporting Requirements

For the 5 grants listed in the previous section, 3 are ongoing projects and 2 are closed out. All of programmatic and fiscal reports, interim and/or final, have been submitted per each grant agreement.



c. Staff Expertise

Metroparks has the organizational experience to implement the proposed project described in this application. Metroparks has established systems in place to administer grant awards, and regularly develops, bids, and manages construction projects using in-house professional staff.

While there are project partners in support of Project Beacon, we are not proposing a coalition as described in the NOFO. Therefore, no Memorandum of Agreement (MOA) is included with this CPRG application.

John Hull and **Mark Bonifas** of **Verdantas**, formerly Hull & Associates, provided engineering estimates for the project and are providing consulting services for necessary permitting through the US Environmental Protection Agency and the State of Ohio EPA. Verdantas has a long-running and detailed understanding of the Dura and Tyler sites.

The engineering estimates were confirmed by **CS Energy**, formerly Conti Construction Company that has constructed over 40 solar arrays on brownfield sites throughout the United States, including the Brooklyn landfill in Cuyahoga County. **Rishabh Sardana** was the primary point of contact in the process.

Attorneys **Mike Wise** and **Chad Arfons** from **McDonald Hopkins** in Cleveland are subject matter experts in the solar space and have been advising Metroparks on structure and financing alternatives.

George Barlow, CPA of **Novogradac & Company**, is preparing detailed pro-formas based on financing plans and the terms of any Power Purchase Agreements that are being negotiated.

Attorney **Amy Natyshak** from Toledo-based **Marshall Melhorn** represents the Metropark Toledo Foundation.

Ongoing Operations and maintenance will be contracted through **Palmer Energy**. **Mark Frye**, owner and CEO of Palmer Energy has provided extensive consulting and will take the lead on negotiating a Power Purchase Agreement for the array's energy output. Extensive proprietary modeling has been provided by Mark and his team and we are confident that a market-based Power Purchase Agreement will provide a reliable stream of cash flow that will cover the annual maintenance costs and expenses associated with long-term permanent financing of the project.

For this CPRG grant application, **Hans Rosebrock**, Director, Power Energy Services & Project Manager with **The Mannik & Smith Group**, provided technical expertise.



7. BUDGET

a. Budget Detail

The proposed GHG reduction measures as part of Project Beacon is a project for which additional funding from the CPRG program is needed to fully implement the proposed project.

Based on the engineering estimates and indicative pricing, the cost to construct the array and place into service will be no more than \$30 million. Attorneys Mike Wise and Chad Arfons from McDonald Hopkins in Cleveland are subject matter experts in the solar space and have been advising Project Beacon on structure and financing alternatives.

A project cost estimate was included in the Solar Feasibility Analysis. PV System cost is based on many variables including system size, equipment selection, site preparation, quantity of subarrays, location of the point of interconnection, etc. The budgetary project costs were developed based on typical PV system cost benchmarks as well as notable onsite conditions. The National Renewable Energy Lab (NREL) produces annual PV benchmarking studies which formed the basis of the PV System cost. The resulting project cost estimate provided the base level of detail necessary to develop project cash flows and general PV feasibility. Project cash flows should be revised at the procurement stage with actual construction costs.

Project costs were further amended to account for non-penetrating ballasted racking, union labor, overhead transmission lines from the Dura and Tyler Road parcels to the Stellantis plant, and costs associated with electrical and structural balance of system (BOS). While PV module and inverter costs have reduced in most cases since 2020, these costs were not changed due to trade tariffs and supply chain shortages common in the current market (glass, steel, polysilicon wafer).

First Solar PV panels were selected for this project because they are a local manufacturer. Additionally, Solar FlexRack was selected for racking due to their partnership and integration with First Solar.

Project Beacon can provide a positive cash flow that would help offset Metroparks Toledo's annual operating expenses. The production of the array could be sold into the grid or directly to a nearby, large industrial customer that could consume all the output onsite. The potential worth varies materially depending upon the route to market.

Ideally, the production from the array would be absorbed by a large industrial energy consumer as a behind the meter array. In addition to the wholesale market value discussed above, a large consumer absorbing the electric output onsite could lower its electric distribution costs and take advantage of the electric output from the array to reduce the plant's generation capacity and transmission peaks.

In summary, by far the greatest potential value for selling the electric output from Project Beacon is to a large industrial consumer that can buy that much power and where it could be considered onsite.



The breakdown of costs for Project Beacon are as follows:

- Module: \$5,071,000
- Inverter: \$1,057,000
- Electrical BOS: \$2,324,000
- Structural BOS: \$7,607,000
- Install Labor and Equipment: \$3,170,000
- Trans and Line: \$1,057,000
- Permitting: \$423,000
- Sales Taxes: \$845,000
- EPC Overhead: \$1,479,000
- Developer Overhead: \$1,479,000
- EPC Developer Profit: \$1,690,000
- Performance Bond: \$348,700
- Contingency: \$2,493,000

If awarded CPRG funding, it would go towards the equipment supporting this project, specifically the Electrical and Structural Balance of System (BOS). In photovoltaic (PV) construction, “balance of system” (BOS) is a term used to broadly refer to all components, equipment, structures, and services necessary to create an operational generation project, beyond the PV modules themselves. For the entire budget of \$29,043,700, the costs are broken out into two categories as shown in the attached budget spreadsheet:

- Equipment: \$20,286,000
- Other: \$8,757,700

Our current work on the \$225 million Glass City Riverwalk¹¹ project demonstrates that it takes a coordinated effort to ensure that we make the most of the region’s forward movement to transform our collective future. Together, we are accomplishing this vision of a united community that has a strong regional presence. The requested CPRG grant funds will play a critical role in filling a funding gap and support the broader campaign for a project with significant local and regional impact. An investment in the Project Beacon is an investment in our region’s vision to reinvent itself. All elements of the project have been shown to be technically and financially feasible and the project is ideally suited to an appropriate progression from grant award to construction.

We understand that no cost sharing/matching funds are required as part of the CPRG application, and have not included them with this request. However, Project Beacon anticipates utilizing the Inflation Reduction Act to provide up to 50% of the construction cost in the form of a federal payment after the array is placed into service.

In reviewing the Notice of Funding Opportunity, we are requesting \$9,931,000 in CPRG funds for the Electrical BOS (\$2,324,000) and Structural BOS (\$7,607,000). This would place the project in Tier E as outlined in the Notice of Funding Opportunity.

¹¹ <https://www.glasscityriverwalk.com/>



b. Expenditure of Awarded Funds

Project Beacon is well positioned and ready to finalize design and permitting and begin construction. The proposed timeline for the remainder of 2024 includes the preparation of bid documents, selecting the engineering, procurement, and construction (EPC) contractor, interconnection application preparation and review, and building permit review.

The timeline is contingent on the approval from Ohio EPA for the construction of the phase 1 array on the Dura site and then the US EPA approval for the construction on the phase 2 array on the Tyler site.

The plan calls for completing the array and placing it into service in 2025.

c. Reasonableness of Costs

As noted in the Solar Feasibility Analysis for this project, PV System cost is based on many variables including system size, equipment selection, site preparation, quantity of subarrays, location of the point of interconnection, etc. Budgetary project costs were developed based on typical PV system cost benchmarks as well as notable onsite conditions. The National Renewable Energy Lab (NREL) produces annual PV benchmarking studies which formed the basis of the PV System cost. The resulting project cost estimate provides the base level of detail necessary to develop project cash flows and general PV feasibility. Project cash flows will be revised at the procurement stage with actual construction costs.

The 10-MW benchmark was used for both the Tyler and Dura Road sites as it is expected that both sites would be constructed by the same developer during one mobilization. Ballasted racking (Structural BOS) is based on a budgetary quote from Solar FlexRack (\$0.16/WDC) and ballast from Lindsay Precast (\$0.20/WDC). There will be opportunities to value engineer racking and ballast to reduce structural BOS costs during the design phase of the project. As such, it is recommended that use of the conservative pricing received from structural and concrete vendors is recommended at this preliminary stage.

Exclusions in the high-level cost estimate included as part of the Solar Feasibility Analysis:

1. Underground conduit and cabling at the Stellantis Plant as it is unknown where the point of common coupling will be located on the property
2. Step-down power transformation at the Stellantis Plant as the electrical configuration of the plant is unknown
3. Upgrades to the existing substation or power distribution equipment

Operations and maintenance costs constitute the largest component of the lifecycle operating expense of a PV system. O&M activities include landscape maintenance, module washing, preventative maintenance such as inverter filter cleaning and scheduled maintenance, performance monitoring, and reactive maintenance. Average annual O&M costs for utility-scale solar range between \$5 to \$8/kWDC (\$0.005 to \$0.008/WDC) while commercial solar O&M may be \$12 to \$30/kWDC. The Tyler/Dura Road sites are somewhat larger than a typical commercial PV system but relatively small compared to utility-scale solar. For budgetary purposes \$15/kWDC/year can be used with a 2% annual escalation rate for the life of the maintenance.