Environment and Natural Resources Trust Fund

2021 Request for Proposal

General Information

Proposal ID: 2021-398

Proposal Title: Cleaner Air for Park Events and Disaster Resilience

Project Manager Information

Name: Tom Hagel

Organization: City of Saint Paul - Saint Paul Parks and Recreation Department

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Project Basic Information

Project Summary: Procure three mobile solar battery trailers to displace fossil-fuel generators at urban park and rural/tribal community events, and for response to outages and disasters. Measure air pollution results.

Funds Requested: $360,000

Proposed Project Completion: 2023-06-30

LCCMR Funding Category: Air Quality, Climate Change, and Renewable Energy (E)

Project Location

What is the best scale for describing where your work will take place?

Statewide

What is the best scale to describe the area impacted by your work?

Statewide

When will the work impact occur?

During the Project and In the Future

Narrative

Describe the opportunity or problem your proposal seeks to address. Include any relevant background information.

Public outdoor events generally incorporate an extensive network of auxiliary diesel and gas generators to provide supplementary power for lighting, device charging, concessions, and sound. These generators create air and noise pollution, present a direct hazard to local air emissions reduction efforts, and reduce event accessibility for members of our community. The generators release particular matter (PM2.5) which is harmful to human health, especially for those in environmentally vulnerable communities or with respiratory health concerns.

Each summer, Parks in the Twin Cities Metro area coordinate over fifty Art and Street Fairs, hundreds of Music Festivals, and thousands of smaller gatherings (Movies in the Park events, outdoor sport gatherings, weddings, and concerts). These events have portable generators ranging from 2-10kW as the go-to power source for everything from vendor booths, stages, sound and lighting, interactive art exhibits, and Food Trucks. Across Greater Minnesota, similar events occur.

Minnesota residents who visit outdoor events, especially in parks, should not be exposed to local air pollution hazards. Renewable energy and battery storage technology options can now provide the needed electricity for events and power outages, allowing us to reduce pollution, increase accessibility, and directly engage Minnesotans in clean energy adoption mobile solar systems

What is your proposed solution to the problem or opportunity discussed above? i.e. What are you seeking funding to do? You will be asked to expand on this in Activities and Milestones.

We propose to reduce fossil fuel dependency in temporary public events and disasters by procuring, deploying, and monitoring three solar battery trailers. Through this program, the Parks and Recreation Departments of two urban cities in Minnesota, St. Paul and Minneapolis, as well as other Parks and Recreation Departments in greater Minnesota, will have access to clean energy.

Our project will partner with St. Paul and Minneapolis Parks systems, University of Minnesota scientists and energy experts, and the non-profit Footprint Project to deploy clean energy trailers at public events in the metropolitan area and in Greater Minnesota. We will calculate the comparative air quality impacts of using conventional fossil-fueled generators, extrapolate it statewide, and educate event personnel, parks staff, volunteers and the public about the alternatives. Additionally, when disasters and grid outages occur, the trailers will be deployed to provide emergency resilient clean energy services across Minnesota. We will calculate the cost-benefit impact of using generators or mobile solar trailers.

We will purchase 3 mobile trailers outfitted with solar panels and a battery storage system, 2 for use in St. Paul and Minneapolis Parks, and one for deployment across Greater Minnesota to selected events in tribal, rural, and regional center communities.

What are the specific project outcomes as they relate to the public purpose of protection, conservation, preservation, and enhancement of the state's natural resources?

1) Enable measurable air pollution and carbon emissions reductions from auxiliary power at outdoor park events, protecting Minnesotans from health hazards while enjoying parks.

2) Reduce air pollution and carbon emissions during disaster response. Where the power grid has failed, auxiliary power is needed for both emergency operations and house-hold power. Rapid deployment of solar trailers for emergency power reduces the localized negative air quality impacts of the fossil-fuel alternative, providing resiliency for those most vulnerable.

3) Educate city, county and tribal staff, volunteers, and the public and increase awareness and adoption of clean energy as a viable alternative to conventional polluting generators.

Activities and Milestones

Activity 1: Procure three solar battery trailers

Activity Budget: $230,000

Activity Description:
Procure three solar trailers, one for use by St. Paul Parks & Recreation, one for the Minneapolis Park Board, and one to be managed by the non-profit Footprint Project (FP).

Activity Milestones:

Description	Completion Date
5) Train city staff on management of trailers.	2022-06-30
4) Receive and inspect solar trailers.	2022-06-30
3) Footprint Project will procure one solar trailer system for competitive price.	2022-06-30
2) Project lead St. Paul Parks will procure two solar trailer systems in cooperation with the City of Minneapolis.	2022-06-30
1) Finalize system specifications, including trailer frame size, battery and inverter capacity.	2023-06-30

Activity 2: Activate the solar trailers to power outdoor events

Activity Budget: $40,000

Activity Description:
Set up a seasonal use schedule for urban and rural events that would otherwise require temporary gas or diesel generators. Work with event and power planning teams to evaluate energy loads for specific events and determine where the solar trailers are best suited to provide power (lighting, sound, refrigeration, food trucks etc).

Activity Milestones:

Description	Completion Date
6) Perform Event Energy Load Audits of two events for each Park Board (St. Paul and Minneapolis) where their solar trailer is used. Identify future mobile solar power opportunities.	2022-06-30
5) FP will deliver FP-owned solar trailers and provide training and support for 5-10 events in greater Minnesota, including county fairs, state parks, tribal events, to be determined.	2022-06-30
4) FP will support St. Paul and Minneapolis Park Board staff with set up and monitoring of solar trailers for their first three events.	2022-06-30
2) Solar Energy Awareness Workshop for Park Event Planners: Train event planners on solar trailer operation, set up and take down. Determine expected energy loads to be powered off solar trailers during an event activation	2022-06-30
1) Sign Memorandums of Understanding with St. Paul and Minneapolis Park Boards.	2022-06-30

Activity 3: Deploy them to local and regional disasters

Activity Budget: $50,000

Activity Description:
When extreme weather events occur, work with local and regional disaster response agencies to integrate three solar trailers into disaster response and recovery operations. Assess the energy loads for specific deployment needs (communications, lighting, refrigeration, emergency command, etc) before disasters strike. Model comparative air

pollution impacts. After disasters, provide solar trailer dispatch delivery, set up, monitoring and maintenance support for partner response agencies.

Activity Milestones:

Description	Completion Date
5) UMN scientists will measure electricity demand and profile and model air quality impact.	2022-06-30
4) Perform Disaster Energy Load Audits of two disaster deployments for two where the solar trailer is used. Identify future mobile solar power opportunities.	2022-06-30
3) During disasters, FP will deploy and monitor use of trailers by partner disaster relief organizations.	2022-06-30
2) Solar Energy Awareness Workshop for Disaster Responders: Train response agencies on solar trailer operation, set up and take down. Determine planned energy loads to be powered off solar trailers during a disaster response activation.	2022-06-30
1) Sign Memorandums of Understanding with local and regional disaster response agencies.	2022-06-30

Activity 4: Study the impact

Activity Budget: $40,000

Activity Description:
Evaluate the holistic conservation and resilience benefits of using solar trailers in place of gas and diesel generators for auxiliary power at events and disasters.

Activity Milestones:

Description	Completion Date
4) Compile results and disseminate information via websites and webinars	2022-06-30
3) UMN energy experts evaluate cost-benefit comparison and economic analysis, including fuel usage, health and resiliency impacts, and permitting and electrical standards.	2022-06-30
2) UMN scientists will profile and model air quality and climate impacts.	2022-06-30
1) Compile all data associated with event and disaster solar trailer deployments, including energy demand and profile.	2022-06-30

Project Partners and Collaborators

Name	Organization	Role	Receiving Funds
Tom Hagel	St. Paul Parks & Recreation	Manager	Yes
Assistant Prof. Gabriel Chan	University of Minnesota	Research energy	Yes
Prof. Jason Hill	University of Minnesota	Research air emissions	Yes
Akisha Everett	University of Minnesota	Outreach, logistics, etc.	Yes
Ellen Anderson	University of Minnesota	Research, consulting, writing, training/education	Yes
Greta Goetz	Footprint Project	Logistics, support	Yes
Will Heegaard	Footprint Project	Technical support, trailer Procurement, etc.	Yes
Shane Stenzel	Minneapolis Parks & Recreation	Events, permits, deployment	Yes
Michael Hahm	St. Paul Parks & Recreation	Director	Yes

Long-Term Implementation and Funding

Describe how the results will be implemented and how any ongoing effort will be funded. If not already addressed as part of the project, how will findings, results, and products developed be implemented after project completion? If additional work is needed, how will this be funded?

The solar trailers to be procured incorporate power components (Solar Panels, Batteries and Inverters) that carry at minimum 5-year warranties. We intend to use lessons learned from this pilot to provide recommendations on the widespread use of mobile solar energy or other clean renewable energy systems for events and disasters in Minnesota. Project partners will disseminate the results broadly. Minneapolis and St. Paul Park Boards will retain ownership of their solar trailers and will be encouraged to continue high-visibility deployments at events and disasters in their areas, with support from Footprint Project when available. Footprint Project will focus on dispatching its solar trailer to events and disasters in greater Minnesota in an effort to both reduce pollution from temporary generators and spur awareness of sustainability in disaster preparedness and response.

Project Manager and Organization Qualifications

Project Manager Name: Tom Hagel

Job Title: Operations Manager

Provide description of the project manager's qualifications to manage the proposed project.

Manage and maintain City of St. Paul Parks & Recreations facilities, parks and green spaces. Also manage varying sizes of events throughout the city and responsible for many aspects of the city's emergency management mass care response program.

Organization: City of Saint Paul - Saint Paul Parks and Recreation Department

Organization Description:

Saint Paul Parks and Recreation is a nationally accredited and gold medal award-winning organization that manages 179

parks and open spaces, AZA-accredited Como Park Zoo and Conservatory, 25 city-operated recreation centers, more than 100 miles of trails, an indoor and two outdoor aquatic facilities, a public beach, a variety of premium sports facilities, municipal golf courses, and Great River Passage – which is the new identity for all proposed public development along Saint Paul's more than 17 miles of Mississippi riverfront. Saint Paul Parks and Recreation is also the proud home of Right Track, a youth employment initiative changing the face of Saint Paul.

Mission

To make Saint Paul a city that works for all of us, Saint Paul Parks and Recreation will facilitate the creation of active lifestyles, vibrant places and a vital environment.

Budget Summary

Category / Name	Subcategory or Type	Description	Purpose	Gen. Ineligible	% Benefits	# FTE	Classified Staff?	$ Amount
Personnel								
Ellen Anderson		Energy analysis and documentation, writing and disseminating results online, project management and stakeholder coordination			0%	0.2		$20,000
Akisha Everett		Community Outreach, Minneapolis project liason, logistics			0%	0.4		$19,373
Professor Jason Hill		calculating comparative air Emissions			26%	0.02		$4,603
Assistant Professor Gabriel Chan		Lead Energy Researcher			36.5%	0.03		$7,017
Graduate student Humphrey School		Energy measuring and research			123.17%	0.18		$17,709
Graduate Student CFANS (UMN)		Air emissions researcher			45%	0.4		$19,398
							Sub Total	**$88,100**
Contracts and Services								
Footprint Project (nonprofit)	Sub award	Staff support for technical expertise, trailer procurement and operations, consulting, logistics, training				0		$58,000
							Sub Total	**$58,000**
Equipment, Tools, and Supplies								
	Equipment	2 Energy Monitoring Meters	Measure electricity usage, demand in different situations					$1,400
	Equipment	Solar Trailer	Trailer equipped with solar panels and battery for mobile clean electricity					$210,000

							Sub Total	**$211,400**
Capital Expenditures								
							Sub Total	**-**
Acquisitions and Stewardship								
							Sub Total	**-**
Travel In Minnesota								
	Miles/ Meals/ Lodging	staff travel and meals	Staff will travel to approximately 6 locations in greater MN to deploy trailers at community events; travel in MN to deploy solar trailer as needed for extreme weather/natural disasters needing rapid response electricity access					$2,500
							Sub Total	**$2,500**
Travel Outside Minnesota								
							Sub Total	**-**
Printing and Publication								
							Sub Total	**-**
Other Expenses								
							Sub Total	**-**
							Grand Total	**$360,000**

Classified Staff or Generally Ineligible Expenses

Category/Name	Subcategory or Type	Description	Justification Ineligible Expense or Classified Staff Request

Non ENRTF Funds

Category	Specific Source	Use	Status	Amount
State				
			State Sub Total	**-**
Non-State				
			Non State Sub Total	**-**
			Funds Total	**-**

Attachments

Required Attachments

Visual Component

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Alternate Text for Visual Component

Solar Trailer activated for event or emergency response.

Administrative Use

Does your project include restoration or acquisition of land rights?

No

Does your project have patent, royalties, or revenue potential?

No

Does your project include research?

Yes

Does the organization have a fiscal agent for this project?

No


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