Purchasing Division
Finance Department

Room 120
411 West First Street
Duluth, Minnesota 55802

218-730-5340
purchasing@duluthmn.gov

Addendum 2
Solicitation # 23-99655
Request for Qualifications for Site Assessment & Evaluation for Solar PV & Storage

This addendum serves to notify all bidders of the following changes to the solicitation documents:

1 Information and clarification of the City's Renewables Advancing Community Energy Resilience Grant is included in the attached "Statement of Project Objectives".

2. The following will clarify the Proposal Requirements and Format:

4. Personnel and Materials Fee Schedule – Please submit in separate sealed envelope, one copy of the personnel and materials fee schedule, clearly marked on the outside as "Cost Proposal" along with the responder's official business name and address. Terms of the proposal as stated must be valid for the project length of time. Please **do no**t include any cost information in the Proposal.

PROPOSAL SUBMITTAL

Submit an original copy of the proposal, plus a flash drive containing the proposal and cost proposal, in an envelope marked "Site Assessment & Evaluation for Solar PV & Storage to:

City of Duluth Purchasing Division
411 West 1st Street, Room 120
Duluth, MN 55802

Please acknowledge receipt of this Addendum by initialing and dating Addendum 2 below the bid form on the invitation for bids.

Posted: **10/10/23**



Form Follows Function (F3):
A framework for community-based energy resilience planning in the Midwest

DE-FOA-0002597 Renewables Advancing Community Energy Resilience (RACER)
Topic 1: Innovative Community-Based Energy Resilience Planning

Principal Investigators

Mindy Granley
City of Duluth Sustainability Officer
mgranley@duluthmn.gov
218-730-5334
411 W. 1st Street, Duluth, MN 55802
Local Government

Jodi Slick
Ecolibrium3 CEO
jodi@ecolibrium3.org
218-336-1038
2014 W. Third Street, Duluth, MN 55806
501(c)3

This two-year project seeks to build innovative community-based energy resilience planning methodologies and metrics to inform priority deployment of renewable energy and storage assets within a community.

Project Overview Format

Background

Form Follows Function (F3) is an innovative and replicable community-based energy resilience planning process that integrates new and existing resilience metrics, extends preparedness and response plans, and is developed concurrently using top-down and bottom-up processes through deep engagement with diverse community stakeholders. To meet the critical needs of a community during various periods of grid disruption, the project focuses on energy resilience by developing greater understanding of functional needs at different community-scales and deployment potentials of solar PV plus storage, along with distributed micro-resilience resources (DMRRs). The F3 Framework is applicable to communities across the nation, however the development process and test replications focus on cold climate communities subject to multiple hazards and builds off of past disasters experienced in northeastern Minnesota. This approach will develop novel community-based research that informs resilient energy improvements, de-risks projects for local partners, and is responsive to, and centered-on, traditionally marginalized communities at greatest risk of negative impacts associated with climate change, disasters, and grid outages.

The F3 Framework planning process is designed to address the complexity of community energy resilience planning by creation of a framework and tools that incorporates the needs of utilities and governmental entities to determine the form of the grid and grid assets, while allowing users to participate in defining the critical functions required against multiple outage scenarios at an individual and shared resource level. This process recognizes the need for, and develops, an accessible human-centered design process to inform community energy resilience plans AND effective implementation pathways.

Overall Objective

To expand existing energy resilience planning tools to improve accessibility to smaller communities that are most at risk of low-attention disasters through streamlined use of existing tools, development of new stakeholder engagement processes, analysis of assumptions against existing methodologies, development of metrics, and applied testing for replication.

Statement of Novelty

The project extends current resilience planning methodologies through novel social science research combined with traditional asset-based approaches to create a planning process accessible to communities that lack extensive planning capacity and firmly places solar and storage solutions within the greater context of system, shared, and distributed micro-resilience approaches.

Technical Work Plan

Budget Period 1 (12 months)

Task 1- Baseline Hazards Analysis and Disruption Scenario Development
Using existing multi-hazards mitigation plans, FEMA's Hazus program models, research of historical disasters in the target community, and stakeholder input, we will develop 8-12 grid disruption scenarios as a baseline for research and model development. Disruptions scenarios may include cascading failures with other critical systems as required to adequately mitigate negative impacts from disruptions.

Subtask 1.1- Complete Past Disaster and Hazus Analysis
Review Multi-hazard Mitigation Plan for past disaster experiences and projected vulnerabilities. Using Hazus, quantify potential exposures for target geography. Determine any expected variances in hazard vulnerability between target and regional geography.

Subtask 1.2- Develop Critical Systems & Disruption Scenarios
Through consultation with the Critical Infrastructure Team (inclusive of IOU/grid operator, municipally-owned water and gas utility, public works and utilities, waste water district, state, county, and city emergency management, and the Ready North Network determine 8-12 power disruption scenarios (e.g. grid outage during high heat event versus extreme rain) with functionally different potential negative impacts or mitigation solutions.

Milestone 1- Disruption Scenarios with Identified Modifiers for Midwest Communities
A minimum of 8 functionally different grid disruption scenarios have been identified for the target community with an indication of likelihood and severity. Modifiers have been identified for potential variances reflective of the larger midwest region to aid toolkit creation and workshop replication to communities reflected in Task 5.

Task 2- Bottom-Up Functional Resilience Analysis through Community-based Methodologies
Develop and test a methodology for creating community-based minimum resilience baselines in response to grid disruption scenarios and negative impacts experienced by community entities (i.e. households, businesses, institutions). Define potential/desired resilience solution sets to reach established community-based minimum resilience standards.

Subtask 2.1- Translation to Individual Experience & Negative Impacts
Conduct focus groups to develop priority negative impacts to be evaluated related to each grid disruption scenario. Focus groups to include community stakeholder groups experienced in disaster response,provision of critical social services, and representation from traditionally marginalized/vulnerable communities. An example translation of disruption scenario to negative impact could be 24-hour grid outage during heavy rain event resulting in 1) sump pump failure/flooded basement, 2) loss of refrigeration/food, etc.

Subtask 2.2- Distributional Analysis of Negative Impacts
Through multiple modes of delivery including online, mailed, and door-to-door canvass of the community (with oversampling in socially vulnerable areas) determine distribution against time, and cost where appropriate, historical/anticipated impact of negative impacts for each discrete grid disruption scenario.

Milestone 2- Completion of Community Resilience Distributions
A minimum of eight (8) statistically significant community resilience distributions have been completed representing a diversity of likely grid outage scenarios. Analysis includes developing understanding of the population characteristics, associated green and built environments, and existence of resilience solutions, as appropriate, to better understand the distribution and potential mitigation interventions.

Subtask 2.3- Development of Community-based Minimum Resilience Metrics
Conduct two workshopping sessions with community stakeholder group defined in Task2.1 to 1) refine community resilience distributions, define and prioritize additional data needs, determine draft community-based minimum resilience standards, and provide initial solution sets, and 2) respond to cost-benefit analysis of solutions brainstormed during first session, and establish minimum resilience standards.

Milestone 3- Completion and Vetting of Community-based Minimum Resilience Standards
A minimum of eight (8) Community-based Minimum Resilience Standards have been created with an analysis of the population currently below that standard and potential solutions identified to advance all community members to the minimum standard. Solutions may reflect systems level solutions (concurrently being developed in Task 3), shared, and distributed micro-resilience resources).

Task 3- Top-Down Asset-based Energy Resilience Planning
Project partners will identify public, institutional, and critical infrastructure sites for viability as community energy resiliency sites. Technical evaluations will be conducted on priority sites for solar, solar + storage, and/or storage options identified.

Subtask 3.1- Establish Asset-based Resilient Power Siting Criteria
Applying Task 1 research including evaluation of grid outage data, past disaster damages, power resiliency for critical facilities, and social vulnerability indices, outline potential project siting and evaluation criteria.

Milestone 4- Completion of a Resilient Power Siting Criteria evaluation rubric.

Subtask 3.2- Mapping of Solar/Storage Sites & Determination of Data Needs
Identification and mapping of geospatial, structural, and field-collected data in alignment with Resilient Power Siting Criteria. Identification of 10-15 publicly-owned and available sites for potential renewable energy and storage development sites (to include open land, large buildings, water reservoir infrastructure, closed landfills, and brownfields). Determination of data needs to evaluate each site for suitability, costs, and benefits.

Milestone 5- Identification of 10-15 potential sites with technical/legal/financial evaluation plan established and consultant procurement complete.

Subtask 3.3- Site Investigations and Cost Analysis
Gather online data and conduct preliminary field work required for investigation for renewable energy siting, including soil borings, slope analysis, wetland identification, roof or reservoir cap structural integrity, property liens/liabilities, etc. Conduct technical, cost, and legal analysis to determine a prioritized list of resilient power sites/system solutions reflective of highest resiliency return on investment.

Milestone 6- A prioritized list of ten to fifteen community energy resiliency site assets is produced, laying out potential barriers that will need to be removed for future community resilience energy projects. The vetted and prioritized site list removes unknowns of future project partnerships, and decreases risk for all partners in resilient energy project development, establishes a phased pathway for implementation, and models an asset-based approach applicable to local governments.

Go/No Decision Point BP1- Multi-hazard disruption scenarios have been developed and inform creation of discrete negative impacts for community-based research to be conducted in BP2. Asset and hazards mapping have been completed to inform deeper technical analysis of community sites for solar/storage placement.

Budget Period 2 (12 months)

Task 4- Form Follows Function Model and Community Energy Resilience Plan Development

The results from asset mapping and technical analysis will be combined with community-based minimum resilience data and strategies to identify pathways for

community energy resiliency projects (solar and/or storage, microgrid potential). Legal and economic analysis of project sites/programs will be expanded, resulting in an integrated approach that includes public development of solar/storage sites, shared solutions, and as appropriate distributed micro-resilience solutions. Shared values and benefits from proposed approaches will be identified.

Subtask 4.1- Combined Analysis & Prioritization of Deployable Resources Inclusive of Systems, Shared, and Distributed Micro-Resilience Resources
Combine models from Tasks 2 & 3 to identify community energy resilience project pathways that have significant overlap in technical feasibility and intended shared values and benefits. Analyze asset-mapping and community input models to identify specific energy resilience projects and pathways.Complete any additional legal/financial/technical analysis for combined solutions.

Subtask 4.2- Complete Community Energy Resilience Plan
Draft Community Energy Resilience Plan for review by Critical Infrastructure Team and Community Stakeholder Group. The plan should include projects (Task 3), programs identified to advance shared solutions and adoption of distributed micro-resilience resources, and enabling policies/partnerships. Conduct public review of plan to feedback on identified energy resiliency projects and pathways. Direct outreach for incorporation of plan elements into resilience/hazards planning by other governmental agencies and critical systems operators will be completed.

Milestone 7- Completed Duluth Energy Resilience Plan and plan template for incorporation into Task 5 Toolkit.

Task 5- Toolkit Development and Testing
This task will bring together the F3 model and approach into a replicable format through development of a Toolkit and workshopping of the methodology with two communities. The replications will focus on establishing community-informed plans with actionable projects and a planning process that minimizes the capacity needed to achieve a successful outcome. This task emphasizes optimization of approaches used in Tasks 1-4 to increase the applicability to smaller communities and/or those lacking resilient energy planning capabilities.

Subtask 5.1- Develop Community Energy Resilience Planning Toolkit
Development of Community Energy Resilience Planning Toolkit to include methodology for application of resilient power as a lens for expanding multi-hazard mitigation planning, creation of disruption scenarios, asset-based planning approach and essential geospatial layers, best practices for community engagement and establishment of Community-based Minimum Resilience Standards, Duluth case-study, and plan template.

Subtask 5.2- Workshop Toolkit through Community Energy Resilience Planning Community Panels

Using a panel approach, project partners will recruit and support two communities through implementation of the Community Energy Resilience Planning Toolkit. Pre-workshop data gathering and analysis, scope of work development, and scheduling will be conducted. A three-day panel will then be conducted within the community including stakeholder interviews, site visits, and public presentations. The Toolkit and plan template will be revised based upon feedback from replication communities.

Final Deliverable 1- Community Energy Resilience Planning Toolkit and Plan Template optimized for cold climate communities with populations under 250,000 including vetted methodology and metrics for establishing Community-based Minimum Resilience Standards and integrated resilient power solutions sets.

Task 6- Dissemination and Reporting
Project dissemination will be completed during the second budget period with dissemination including publication of papers in appropriate journals and presentations at professional conferences.

Subtask 6.1- Dissemination of Project Methodologies and Model
Due to the blended technical and community advancements toward community energy resilience planning anticipated during the project period, dissemination efforts will include climate, adaptation, emergency government, and energy professionals as well as potential community-based user groups like local governments, environmental justice organizations, and social service providers. Three articles/presentations will be developed regarding 1) Community-based Minimum Resilience, 2) Integration of Asset-based and Community-based planning methodologies for resilient power prioritization, 3) Community-based Energy Planning Toolkit application.

Subtask 6.2- Final Reporting
All required reports and deliverables are submitted to the DOE.

Final Deliverable 2- All required DOE RACER grant reports, whitepapers, presentations, templates, and toolkits are delivered to the DOE.