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May 12, 2020

RE: DE-FOA-0002291: REQUEST FOR INFORMATION: FUNDING OPPORTUNITY
ANNOUNCEMENT 2206 "CONNECTED COMMUNITIES"

Dear Madam/Sir:

U.S. Green Building Council is pleased to submit this response to the Request for Information related to the potential Connected Communities Funding Opportunity Announcement. USGBC strongly supports the goals of this potential project as we have already integrated many technical requirements and performance goals that align with the Connected Communities FOA into the voluntary, third party rating systems that USGBC and our partner organizations (Green Business Certification, Inc. and Arc Skoru) develop and administer. Specifically, the Grid Harmonization credit in USGBC's LEED v4.1 Green Building Rating System is an example of how USGBC has worked to increase awareness and establish technical requirements around deployment of grid responsive distributed energy resources in buildings. USGBC is also pleased to be partnering with the New Buildings Institute on an assessment methodology to better direct building to grid interactions called the Grid Optimal Initiative.

Below you will find USGBC's responses to the March 26, 2020 RFI questions. We believe USGBC and our partner organizations provide unique skills regarding performance measurement and verification, project engagement and scaling and we would be very enthusiastic participants across the range of opportunities the Connected Communities initiative creates.

Please feel free to contact me at (202) 492-6804, or bowens@usgbc.org if you have any questions or if there is any other way that we can be of assistance.

Sincerely,

Brendan Owens, PE, LEED Fellow
Senior Vice President, Strategic Partnership and Growth
U.S. Green Building Council



RE: DE-FOA-0002291

Request for Information Categories and Questions – USGBC Responses

Category 1: Technical Requirements

1.1.) Will the proposed FOA requirements support demonstrations that explore the smart load controls and building design load reduction strategies (e.g. high performance envelope, shading, etc.) in combination with other DERs that provide the best options for demand flexibility to meet specific grid needs?

Yes, USGBC believes that buildings are currently vastly underutilized as grid/energy system resilience, efficiency and reliability assets. The requirements for this FOA align very well with emerging and established technologies and should be well positioned to accelerate the scaling of grid responsive DER.

1.2.) How can the FOA be designed to enable future scaling of connected communities beyond pilots?

By linking to established market facing third party certification programs, this FOA could leverage existing market training and delivery channels uniquely suited to raise awareness beyond pilot projects engaged, capitalize on co-benefits associated with project desired market recognition and utilize existing M&V infrastructure efficiently. DOE should encourage applicants to include, and select pilots that will use and test, a diverse suite of existing and emerging third party certification programs for the elements involved in a connected community, such as green building certifications for grid-interactivity, distributed energy resources, and energy efficiency (e.g. [LEED](#)); grid-responsive building metrics (e.g., GridOptimal); and power grid / microgrid performance (e.g. [PEER](#)).

1.3.) What should be the required minimum energy efficiency level or efficiency improvement? How should minimum requirements differ for new versus existing commercial and residential buildings?

It is not clear that a traditional project level energy efficiency requirement best suits the overall goal of this FOA. The goals that have been established seek to integrate grid responsive building level DER more completely into the larger energy system they are connected to and interact with. From this perspective, it would seem that project success should be evaluated at a system rather than project scale. There are any number of currently known scenarios where it is, from a systems perspective, advantageous for a building to consume more energy than needed during certain periods (perhaps storing it for later use). The establishment of minimum project level efficiencies may be counterproductive to utilization of building scale DER.

1.4.) What should be the minimum square feet or number of buildings requirement for each project to demonstrate buildings can contribute as reliable grid resources? Is there a different way to require a minimum project size (e.g. load size)?

In addition to load size and square footage metrics (which both seem to be useful metrics in various ways) we encourage the incorporation of a diversity of use metric in project evaluation. Residential, commercial and industrial building uses can have complementary load shape requirements which may increase the



opportunity for the DER deployed in specific projects to have synergistic benefits. A single building may be a vertical city incorporating multiple opportunities.

We recommend consideration of additional criteria not identified in the RFI. Notably, the characteristics of the grid to which the project is connected is an important variable to consider, in light of total potential benefits. If a project is located in a particularly dirty grid or one that experiences reliability, critical peak or resilience challenges, incorporation of building scale DER will be more valuable. Individually each metric seems to have a blind spot (load size, for example, might make it seem like a data center is a good candidate but if the data center is designed to be at or near 100% capacity 24/7, incorporation of dispatchable DER might be difficult) but combined, square footage, total load, use diversity and grid stress/emissions would likely lead to the identification of projects that will be successful.

1.5.) Is the requirement of including at least two DERs in addition to energy efficiency the right approach to exploring demand flexibility solutions to support grid needs, customer service, environmental and resiliency goals or other considerations and priorities? Should there be a minimum amount of demand flexibility resulting from the combined DERs? If yes what should it be and why? Should it be different for new and existing commercial and residential buildings; if yes how?

The requirement for two DERs seems somewhat arbitrary as individual technologies can have multiple benefits if they are integrated effectively and responsive to the grid signals. DOE could consider an impact metric instead (load, resilience, GHG emissions reductions, storage, peak load reduction, on-site renewable energy utilization, short-term/long-term load flexibility, etc). The threshold DER for the pilot should be measured across the “connected community” and not at a building-by-building scale. Hence it should not be different for (or measured at) the building type.

1.6.) For the proposed FOA “grid resilience” is defined as the functional preservation of the electric grid operations in the face of natural and man-made threats and hazards and “grid services” is defined as services that support the generation, transmission, and distribution of electricity and provide value through avoided electricity system costs (generation and/or delivery costs). Are these definitions appropriate for this FOA or should FOA applicants define grid resilience or grid services in a manner that addresses both building and grid perspectives? If so, how?

These definitions seem appropriate but we recommend including additional strategies including power quality metrics such as voltage sag and swell, voltage and current harmonics as well.

1.7.) Are the required teams “composed of critical stakeholders representing grid resources/assets (e.g. utility), buildings owners/assets (e.g. home builder, building owner, developer, building manager), and researchers (e.g. national lab, university)” and suggested additional collaborators such as “relevant technology manufacturers and local governments” appropriate to meeting outcomes of the anticipated FOA? If not, are there other important partners that should be included?



Third party certification systems and M&V providers as well as non-profit organizations engaged in high performing buildings and/or grid modernization should be a critical part of how this FOA verifies outcomes and ensures that lessons learned can be disseminated. Additionally, teams should include at least one state, regional, or local government entity. DOE could consider inviting State Energy Offices to participate as advisors to pilot projects in their state.

1.8.) Should natural gas technologies be considered in the pilots? If yes, how should they be included?

Possibly, but only to the extent that building system electrification is limited by the capacity of the transmission/distribution network the building is plugging in to.

1.9.) What technical communication (e.g. data access, data transport, network technologies, interoperability) requirements should be included for maximum project effectiveness and future scaling of the technologies? What cybersecurity and privacy requirements should be included?

Advanced meters with capabilities allowing customers who generate their own electricity from on-site or distributed renewable energy sources to manage and measure electricity distribution (either back into the grid, to another end use, to a storage medium, etc).

For Cyber security requirements NIST Framework and Roadmap for Smart Grid Interoperability Standards, Release 3.0 and NISTIR 7628 Revision 1 Guidelines for Smart Grid Cybersecurity Volume 1 - Smart Grid Cybersecurity Strategy, Architecture, and High-Level Requirements are good references.

1.10.) Do any of the outlined criteria present limitations to emerging business models? Should other criteria be considered?

1.11.) Are there new or emerging technologies or strategies that support DER optimization that could leapfrog the outcomes of the anticipated FOA that should be incorporated into pilot design and implementation?

Energy storage, whether thermal and/or battery should be required as part of the strategy to enable a connected community to utilize generation, storage and efficiency strategies as optimally as possible.

Category 2: Funding, Cost share, and Period of Performance

2.1.) Is the proposed DOE funding level per project (i.e. up to \$7 million) reasonable to achieve the drafted FOA objectives? If not what would be more appropriate and why? Note that all demonstration projects must meet a minimum cost share requirement of 50%.

Yes, this seems to be a reasonable amount

2.2.) Is a period of performance of 3-5 years reasonable? If not what is appropriate and why?

Yes, this seems to be a reasonable time frame. Consideration needs to be given as to what level of design the project should complete at time of application. If the intent is to inspire a new design, then a 7 year time frame may be more reasonable to allow time for design, construction and then period of performance



Category 3: Data Sharing/Measurement and Verification

3.1.) How can these pilots best consider, measure, and document energy, building occupant/tenant, and financial impacts?

By utilizing existing third-party certifications and performance measurement systems that align strongly with the goals of this FOA. The LEED Green Building Rating System (for existing buildings, as well as new construction) is an effective framework to assess building systems efficiency, on-site renewable energy generation and off-site procurement, grid harmonization strategies, EV charging capability, and other aspects important to the success of pilot projects. Additionally, the PEER Rating System is uniquely positioned to be used to assess the benefits that accrue to the grid pilot projects are connected to. Finally, the Arc data platform is an ideal aggregation point for verification of benefits realized by pilot projects. Within each of these systems, performance data is verified to achieve credits and points. With collaboration, the data, credits, and points could be leveraged to support pilot projects in achieving and communicating the Connected Communities goals.

DOE should take a broad view of impacts and include co-benefits that are important to stakeholders. This includes emission reductions (conventional air pollutants and GHG), and DOE should be clear about requirements to measure or calculate such benefits on the basis of short-interval data (e.g., hourly or sub-hourly). Where there is EV charging in the connected community, the benefits should reflect avoided emissions associated with the EVs as well as any bidirectional benefit.

DOE should also prioritize data on occupant comfort, health, and productivity, to support subsequent scaling. Projects should use existing platforms, including sensors and other means of occupant feedback, to enable measuring such impacts. The Arc data platform is one example. DOE should select projects such that, across the projects a diverse set of platforms and tools will be used.

Given the current pandemic and uncertainty as to long term impact on normal building use patterns, DOE should consider protocols for accounting for unusual building occupancy in measuring impacts.

3.2.) Are the proposed types of data for measurement and verification consistent with current industry practice and supportive of utility, customer, and other relevant stakeholder decision making? If not, what additional data should be required?

The RFI notes that there will be a BTO-designated third party for M&V. We recommend that in addition to the designated third party, that BTO encourage projects to incorporate certifications and other existing third party verification models to address individual elements. These systems will be especially important in looking ahead to scaling the potential impact of connected communities. See also prior response.



3.3.) How feasible is it for potential applicant teams to collect the required types of data and share at an aggregated level between project teams and publicly? What privacy policies and cybersecurity standards, guidelines, and practices are applicable to the proposed data collection and sharing requirements? What data sharing platforms or mechanisms would be appropriate for sharing data among project teams and with the public?

When projects are leveraging third-party certification infrastructure already in place this should be relatively easy and make for broad comparability. If every project is left to develop its own M&V and communications strategy, the results could be less useful.

In addition to providing verification, using third-party certification streamlines communication of outcome-based requirements with a common set of language for contractors, owners, power providers, operators, and other stakeholders. Federal agencies, state and local governments have used certification for these purposes with good results for years. For example, the FEMA National Mitigation Investment Strategy (2019) recommends certifications to provide users with a common measurement methodology and show value in a user-friendly way.¹

Additionally, DOE should encourage pilot projects to use such platforms to share interim data and results during the project, and not wait for 3, 5 years or longer when final reports are submitted.

3.4.) What are the critical issues that need to be addressed to successfully evaluate, measure and verify impact of multiples DERs?

Peak load impact, on-site renewable energy utilization efficiency, grid carbon alignment, short-term load flexibility, long-term load flexibility, dispatchable generation/storage, occupant engagement; co-benefits; costs

Category 4: Other

4.1.) How can DOE best design the FOA to allow applicant teams to form and provide strong proposals? What additional aspects should be considered for successful pilot design and implementation?

DOE should consider subcategories to reflect diversity of scenarios. For example, a campus setting under single control; a central business district; a residential neighborhood; etc. DOE could solicit local governments and business improvement districts (BIDs) with a demonstrated commitment and investment in data systems to identify their interest in the program (analogous to the teaming partners). For example, cities and BIDs participating in LEED for Cities and Communities are deeply engaged with performance data.

4.2.) Is there any other feedback on the FOA goals, design, requirements, etc. you would like to provide?

¹ [FEMA, National Mitigation Investment Strategy](#) - see page 8-9.