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ES4SE Technical Assistance Program Evaluation

Technical Memorandum

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Foreword

The U.S. Department of Energy's Energy Storage for Social Equity (ES4SE) Initiative is designed to advance the prosperity, well-being, and resilience of urban, rural, indigenous, and tribal disadvantaged communities. It helps these communities address their energy system challenges by considering energy storage technologies and applications as a viable path forward.

The two-pronged effort features a Technical Assistance (TA) Program and Project Development and Deployment Assistance (PDDA) Program. Under the ES4SE Initiative, Pacific Northwest National Laboratory provides direct TA that gives communities the information, tools, and resources needed to understand their community goals and how energy storage and renewable generation technologies can support their needs and long-term resilience, reliability, and independence goals; Sandia National Laboratories then leads the PDDA phase by providing engineering and financial support to deploy energy storage systems in the communities helping convert the TA efforts into tangible results.

The comprehensive and personalized assessments of energy storage feasibility, design, and application provided by the TA Program are intended to not only help communities meet their goals and enable positive outcomes, but also (1) give them a deeper understanding of their energy system challenges and possible solutions, (2) develop a network of people to serve as a valuable resource long after the TA Program is over, and (3) implement solutions to their community-defined challenges.

The results derived from each TA Assessment are reported in technical memoranda such as this one.

More information about the program is available at the following links.
https://www.pnnl.gov/projects/energy-storage-social-equity-initiative
https://www.pnnl.gov/projects/energy-storage-social-equity-initiative/technical-assistance-program

Summary

Technical assistance (TA) programs can provide organizations and communities with the information, tools, and resources needed to support their development and resilience goals. The Energy Storage for Social Equity (ES4SE) TA program sought to empower underserved communities through co-development of energy storage pathways and solutions to address community-defined challenges and needs. Evaluating the design, implementation, and outcomes of TA programs like ES4SE is critical to understanding whether program and participant goals were accomplished and how to adjust the TA approach to better meet participant needs. This evaluation explores the experiences and perceptions of community participants in the ES4SE TA program.

Twenty-four participants from the 14 communities in the first ES4SE cohort were surveyed using Q methodology. Q methodology integrates quantitative and qualitative research approaches to compare perspectives about an issue or experience. Participants were asked to rank 54 opinion statements that represented a range of possible experiences related to TA program development, implementation, and outcomes. After ranking the statements relative to one another, participants were asked about their statement rankings, lessons learned from TA, and recommendations for future programs. Statement rankings were compared using factor analysis and contextualized using quotes from participant discussion. The analysis and interpretation revealed three distinct factors, reflecting different perspectives among participants about their TA experience: those of Community Consultants, Project Specialists, and System Navigators.[1]

- **Community Consultants**. Most participants (seven people from six communities) characterized their experience of TA through references to personal relationships and organizational capacity during program implementation. These participants valued the holistic support of TA, including staff efforts to understand their community context and identify needs. In many cases, these participants felt their project concept or design was not well-defined at the start of the program and appreciated that a specific pathway or solution was not imposed on them. Most of these participants lacked organizational resources or expertise to participate as much as desired and requested more education at the start of the program to build baseline knowledge among the cohort. In turn, these participants suggested more conceptual and institutional work was needed before their development goals could be realized.
- **Project Specialists**. Many participants (six people from five communities) focused on their experience of collecting and applying the information and resources from TA to meet their immediate and specific needs. These participants tended to have a predefined set of goals and expectations for the program, and they prioritized identifying areas where program staff complemented their own technical expertise. In many cases, these participants preferred more structure to focus technical discussions and pathways. Further, some participants questioned the necessity of more holistic program services and wanted clarity on how these broader services connected to the technical dimensions of their project. These participants acknowledged their projects were more developed than some projects of other participants and sought more targeted and streamlined support at this stage.
- **System Navigators**. Some participants (four people from four communities) described TA through experiences that addressed the relationship between institutional authority and project outcomes. These participants wanted to better understand the complexities of their

[1] Seven participants were associated with multiple factors, which highlights the connection between different perspectives and difficulty in categorizing shared experiences.

local political and economic systems and leverage the authority of program staff and other partners to navigate and direct change in ways they could not accomplish alone. These participants valued the ability to define their needs on/in their own terms, and they tended to focus on project outcomes rather than the processes to achieve them. In turn, these participants shared an inward focus and prioritized engagement with the technical team over others in the cohort.

Characterizing and comparing different participant experiences provides insight into how to improve future community-based TA by tailoring the program design and related services to the needs and preferences of participating communities. ES4SE program participants offered lessons learned and recommendations based on their own experience, which are organized below by program stage: development, implementation, and outcomes. In some cases, these insights reflect achievements that should be built upon, whereas in others they represent missed opportunities or institutional constraints.

- **Program Development**. When evaluating their TA experience and looking toward future efforts, participants discussed four aspects of program design and project development: program promotion, program application, roles and responsibilities, and project scoping. Overall, participants appreciated the diversity of expertise and support involved in TA, but they suggested more upfront information could have improved the efficiency of project scoping, including a list of program staff expertise or capabilities and example program services, a list of the types of data likely to be collected, and a list of the technical skills that would benefit participants. Participants felt this information would help clarify the staffing needed to support TA, kickstart internal communication before TA kickoff, and plan ways to address capacity issues early.
- **Program Implementation**. When considering their participation and work with program staff, participants emphasized six areas that affected program implementation: program phases, communication, technology, meetings, webinars and workshops, and compensation. In general, participants praised the flexibility of the program and valued the staff's commitment to addressing the needs of communities across different stages of development. Recommendations for program implementation focused on how to streamline this process. For example, some participants advised staff to create separate tracks or timelines for communities that need to spend more time in concept development before moving to feasibility assessments and technical analyses. Other suggestions included providing mechanisms to reduce time and resource burdens, including through streamlined cohort engagements and webinars, as well as community compensation.
- **Program Outcomes**. When addressing the legacy of program deliverables and outcomes, participants pointed to three topics: network maintenance, attribution and distribution, and knowledge management. Participants regularly acknowledged the need to capitalize on the momentum generated during TA and ensure progress toward community goals. This included ideas for continued communication and networking with the labs and among the cohort, collaborative research and community consulting to demonstrate the value of relationships and resources shared, as well as project progress tracking to measure the feasibility of project design and success of knowledge transfer.

This evaluation demonstrates the overall performance of the ES4SE TA program in collaboratively assessing and addressing community challenges and needs across different energy development contexts, and more importantly, it identifies the diversity of participant experiences and advocates targeted ways to meet their needs through future TA programs. This

technical memorandum provides further insight into these experiences and needs, and its findings provide lessons for community-based engagement beyond TA.

Acknowledgments

We thank the community members who shaped the ES4SE program and this evaluation through their participation. Your commitment to your community, this effort, and openness to discussing your experience for the benefit of others will forever inform the way we understand and engage community-based work. We thank ES4SE program leadership who supported the idea to evaluate this effort and granted us creative license to apply social science methods. We thank the technical team whose curiosity, patience, and flexibility made this program possible. Finally, we thank the Department of Energy's Office of Electricity (DOE-OE) and Dr. Imre Gyuk for support in creating the ES4SE program.

Acronyms and Abbreviations

DOE	Department of Energy
DOE-OE	Department of Energy Office of Electricity
ES4SE	Energy Storage for Social Equity
MOU	Memorandum of Understanding
PCA	Principal Component Analysis
PDDA	Project Development and Deployment Assistance
PNNL	Pacific Northwest National Laboratory
POC	Point of Contact
Q	Q methodology
SOW	Scope of Work
TA	technical assistance

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1.0 Introduction

Technical assistance (TA) programs can provide organizations and communities with the information, tools, and resources needed to support their development and resilience goals. Evaluating the design, implementation, and outcomes of TA programs is critical to understanding whether program and participant goals were accomplished and how to adjust the TA approach to better meet participant needs. The evaluation present in this technical memorandum explores the experiences and perceptions of participants in the ES4SE TA program. The Background section provides a brief overview of TA as a concept and process, as well as a summary of the ES4SE TA program structure and components. The Materials and Methods section outlines the process for obtaining participant feedback and how it was analyzed and interpreted. The Findings section describes the three distinct perspectives of participants related to their TA experience (Community Consultants, Project Specialists, and System Navigators), and contextualizes them through quantitative and qualitative data. The Lessons Learned and Recommendations section offers considerations and guidance from participants for developing and implementing community-based TA programs like ES4SE. Finally, Appendix A includes supplemental data supporting the analysis and interpretation of findings.

2.0 Background

TA as a concept is a valuable part of the ES4SE program, both described below.

2.1 Technical Assistance

As a broad category or concept, TA includes “the transfer of knowledge, expertise, and skills to people, organizations, and communities” (Anderson et al. 2021a). TA is typically non-financial assistance focused on building capacity to improve services, enhance partnerships, or develop technical solutions to complex challenges (Lyons et al. 2016). Although the objectives for different TA efforts may be similar, there is neither one defining feature of TA nor one standard method for its implementation. The right approach for TA is context dependent. Effective TA considers the expertise of TA providers, as well as the needs, capacity, resources, and motivations of TA recipients. To increase the chance of positive outcomes, TA providers and recipients should set clear expectations and, where possible, collaboratively design program elements (Yazejian et al. 2019; Conroy and Mastri 2021).

The reasons for offering or seeking TA are similarly as diverse as the methods available to implement TA. Organizations may seek TA to address emerging, complex issues, improve cross-sector collaboration and communication, relay knowledge and skills, or enhance strategic planning for long-term change that supports technical, educational, or philanthropic missions. TA can be required by federal, state, or local governments and other public or private organizations through grants to ensure compliance with policies, develop best practices, address gaps in services, or plan for organizational change (Anderson et al. 2021b). For example, the Department of Education offered TA to support Title IV implementation in schools designed for the Student Support and Academic Enrichment program (T4PA Center n.d.).

Finding ways to deliver TA in effective and efficient ways is a priority for public and private organizations (West et al. 2012). Although there are no standard models or best practices for TA, there are common thematic elements of effective programs, and several frameworks are

used to direct TA efforts in systematic ways (Baumgartner et al. 2018). Common core elements that ensure quality programs, achieve TA objectives, and improve recipient outcomes include: preparation, planning, implementation, evaluation, and sustainability (Dunst et al. 2018). According to a meta-analysis of TA programs, these core elements "lead to sustainable program and organizational change" (ECPC 2019).

Adequate preparation may include conducting a thorough needs assessment, ensuring practitioners are qualified to deliver the programmatic content, enacting visioning exercises with recipients, and gauging participants' capacity and resources. It is critical to ensure that the TA audience is appropriate, given the objectives of the organization and their capacity for engagement (Lyons et al. 2016). Planning involves selecting and evaluating the fit of models or frameworks used meet the participants' priorities, set realistic goals and expectations, and define the roles and responsibilities of program staff and TA recipients. It is also important during preparation and planning to determine the best format through which TA goals and objectives can be achieved. For example, TA can be individualized or tailored to groups, conducted virtually or in-person, or structured to facilitate peer-to-peer learning (Baumgartner et al. 2018).

Implementation is the process of enacting the framework and objectives for TA through various activities that may include engagement, education, data collection, analysis, and training. Important components of this stage are maintaining the credibility of TA providers by developing collaborative and trusting relationships, maintaining flexibility and responsiveness to participants' needs, and seeking two-way communication and feedback to support program goals. After the TA program, formal evaluation provides data to enable organizations to provide accountability, monitor outcomes, and adjust the TA approach and/or strategies to better meet the needs of TA recipients in subsequent programs (West et al. 2012). However, the evaluation step is often skipped because it introduces additional resource needs and challenges, including generalizing lessons to other TA contexts (Lyons et al. 2016). Finally, sustainability planning is key to ensuring changes enacted through TA are maintained.

Research and practice suggest that TA frameworks that incorporate many or all the above components in an engaging and interactive format have a greater likelihood of meeting organizational goals and successfully addressing the challenges that often hinder TA efforts (Conroy et al. 2021). When TA programs are grounded in an understanding of the recipients and the needs of their organization or community, TA is more likely to sustain engagement with participants over the program period. Intensive programs that occupy longer timelines are often costly and tend to experience participation decline as staff resources become strained or engagement capacity declines (Baumgartner et al. 2018). TA programs in dynamic policy climates typified by staff turnover and changing priorities may also find difficulty recruiting and retaining qualified TA providers (West et al. 2012). Moreover, providing TA programs that ensure equitable access to TA and its benefits for diverse communities should be a primary goal of program design and implementation (Conroy and Mastri 2021).

2.2 Energy Storage for Social Equity Program

This evaluation focuses on the first phase of ES4SE, summarizing the experiences and perceptions of community participants related to TA development, implementation, and outcomes.

In conducting a program committed to social equity, the program team reviewed existing community TA programs to understand different approaches and identify ways to reduce the

burden on applicants and recipients. In turn, they created a streamlined application process, which included an optional interest form for prospective communities or groups to open lines of communication before an application was submitted. This facilitated one-on-one support where needed, ensured the program fit community needs, and reduced the burden of applying. The application itself was designed to be as brief as possible with transparent eligibility and selection criteria.

Program eligibility aimed to be inclusive, minimizing the level of technical knowledge required of the applicants and setting timelines that accounted for their resource constraints. For example, one of the eligibility criteria in the application mentioned "disadvantaged community experiences problems or challenges with their energy system that can be addressed or partially mitigated through electric service delivery and/or energy storage." In this sense, applicants only needed to self-identify as a disadvantaged community that faces energy system challenges to be eligible (e.g., low income, high and/or persistent poverty; high energy cost burden and low energy access; disproportionate impacts from climate change; OMB 2021). However, it is important to note some community members and advocates prefer to use "overburdened and underserved" in place of "disadvantaged." ES4SE uses the term disadvantaged communities to align with Executive Order 14008 (The White House 2021) and subsequent use by DOE offices.

Among the 64 applications submitted, 42 (66 percent) met eligibility criteria. Eight laboratory staff from PNNL and Sandia National Laboratories scored the completed applications and promoted 21 applications for final review. An external review panel was convened to evaluate the applications. The review panel selected 14 applications for program consideration, and the DOE-OE sponsor approved the final participant selection.

Program implementation focused on (1) co-developing holistic TA to enable current and future success and (2) building relationships between program staff and the participant communities and among the communities themselves. Program staff and communities met regularly (e.g., weekly, biweekly, or monthly) throughout the TA phase to maintain relationships, navigate emergent project needs or contextual changes, and address task progress. Communities were also invited to optional, weekly cohort meetings to introduce their community, present their project, and share questions, lessons learned, and contacts.

Program staff supported community participants by serving in three main roles: group leads, project scopers, and task leads.[2] Group leads acted as the primary point of contact (POC) and project facilitator for four to five communities. Project scopers and task leads composed the technical teams. Project scopers collaborated with communities to develop or refine their project concept, assess baseline energy data, and outline a scope of work (SOW) to be conducted during TA. Task leads facilitated and/or conducted specific activities within the SOW, which addressed technical, economic, and social dimensions of energy planning and development.

The technical dimension of TA focused on co-identifying energy challenges and solutions, often through system design and load analyses. The economic dimension focused on developing a sustainable project pipeline by identifying options for future financing and analyzing the economic benefits of different energy solutions. Finally, the social dimension focused on evaluating the inequities and demographic context of the participants to further understand the relationship between the energy system and socioeconomic conditions, as well as the potential workforce impacts of the energy transition.

[2] In some cases, the group lead also acted as project scoper.

3.0 Materials and Methods

Twenty-four participants from the 14 communities in the first ES4SE cohort were surveyed using Q methodology, which integrates quantitative and qualitative research approaches to compare perspectives about an issue or experience (Brown 1980; McKeown and Thomas 2013). Using this methodology, research participants model their perspective by ranking a series of opinion statements that broadly represent the issue or experience of interest (Watts and Stenner 2005). Their quantitative statement rankings and qualitative statement interpretations are compared to identify and classify different groups of perspectives.

Among its wide range of applications, Q methodology (Q) has been used to evaluate educational programs (e.g., Ramlo 2015) and public engagement processes (e.g., Danielson et al. 2010). Here, Q is used to evaluate the experience of community members who participated in the ES4SE TA program led by PNNL. Community perceptions of program development, implementation, and outcomes provide insight into how to improve future community-based TA programs within and beyond the DOE national laboratories.

3.1 Research Stimuli and Participants

The Q sample includes all opinion statements the participants sort and rank. The statements should be sufficiently diverse to capture the full range of participant perceptions. They can be generated from many sources. Following standard methodological practice, a population of statements (N = 260) was generated from literature (n = 164), key informant interviews (n = 58), and ES4SE participant feedback (n = 38) about TA design, best practices, and assessment. Statements were then sampled using the following process:

1. Statements that did not accurately reflect the ES4SE TA program were removed.
2. Statements were organized by program stage (e.g., implementation) and theme (e.g., communication).
3. Similar statements were combined into one or more representative statements.

Statements were then adapted for internal consistency and their focus was balanced to include consideration of the roles of the program, its staff, and the participants. After debriefing the statement sample with program leadership and pre-testing the protocol with select program staff, the final Q sample comprised 54 statements, including 18 statements for each program stage of development, implementation, and outcomes.

Community members who participated in the ES4SE TA program and had regular contact with program staff were invited to participate in the evaluation. Of the 27 community members contacted for the evaluation, 24 (89 percent) agreed to participate. The average number of participants from each community was 1.7

3.2 Data Collection Procedures

Statement sorts and debriefing interviews were conducted using video conference software (October–November 2022; average length = 66 minutes) and were recorded with participant consent. Participants were sent a web link to access online sorting software (Q Method Software). Participants were then directed to read each opinion statement on-screen, consider whether it was “like” or “unlike” their program experience, and sort the statement into one of three piles (like, unlike, neutral). During this stage, participants were encouraged to ask

questions about the meaning of any statement. Next, participants were asked to review the statements in their "like" pile and sort them onto the sorting grid (Table 1), starting with the statements most representative of their experience (column 5) and working toward the center (column 0). Participants were asked to follow the same procedure for the statements in the "unlike" pile, working from the other side of the grid (column -5). Finally, participants were asked to sort their statements from the "neutral" pile into the remaining grid spaces and review their full statement distribution. Participants were permitted to swap statement positions throughout the sorting process. After participants submitted their final Q sort, they were asked a series of debriefing questions about the statements, their rankings, TA, and future program design.

Table 1. Statement sorting grid.

UNLIKE my experience										LIKE my experience
-5	-4	-3	-2	-1	0	1	2	3	4	5

Note: Participants were asked to rank 54 statements within the 54 grid spaces.

3.3 Data Analysis and Interpretation

Statement sorts were analyzed using the online sorting software and validated with a desktop application (PQ Method). First, a principal component analysis (PCA) was performed to explore the commonality and specificity among participant sorts. Common sorting patterns, known as factors, represent shared perspectives among a group of participants.[3] Several criteria were used to select the number of factors to interpret: the eigenvalues, explained variance, number of participants included, and number of participants who loaded significantly on multiple factors (i.e., cross-loading). All factor solutions considered had eigenvalues greater than 1. The first three factors explained 27, 9, and 7 percent of the sorting variance, respectively. The fourth and fifth factors explained 7 and 6 percent. Next, the Varimax algorithm was used to rotate the two-, three-, and four-factor solutions to provide more interpretable factor loadings. Factor loadings indicate the degree to which a participant's sort correlates with the factor. Positive loadings indicate agreement, whereas negative loadings indicate disagreement. A large factor loading indicates a strong correlation between a participant and the factor. Factor loadings of ±0.35 were significant at the .01 level using the standard error of a zero-order loading (Table 2; McKeown and Thomas 2013). The three-factor solution was selected for interpretation because it included the most participants (17, 71 percent) from the most communities (12, 86 percent). Finally, qualitative analysis of interview transcripts was conducted to interpret the factor-specific perspectives. This meant evaluating the statements ranked most like (4, 5) and unlike (-4, -5)

[3] When interpreting and expressing the results of analysis, the "factors" and "perspectives" are often used synonymously (e.g., see Danielson et al. 2010).

participants' experience (Tables 3–5 in Findings), participants' rationale for their rankings, and other significant rankings not captured during the debriefing interviews (Table A.1 in Appendix A). This process revealed patterns within and across factors, including similarities and differences in participant experiences.

Table 2. Participant factor loadings after Varimax rotation.

Participant	Factor A	Factor B	Factor C
P11	**0.7860**	-0.0125	0.0092
P4	**0.7718**	0.1881	0.0288
P22	**0.6928**	-0.1366	0.3132
P8	**0.6530**	0.3448	0.0474
P18	**0.5849**	0.3302	0.2065
P5	**0.5138**	0.1930	0.3069
P16	**0.4234**	0.2643	0.2723
P14	-0.1976	**0.7887**	0.2070
P9	0.2207	**0.5852**	0.2729
P10	0.1946	**0.5276**	0.1609
P17	0.1704	**0.5106**	-0.1497
P21	-0.3211	**0.3701**	0.0693
P19	0.1408	**0.3606**	-0.0094
P2	0.1768	-0.1307	**0.6962**
P15	0.1135	0.1260	**0.6209**
P12	0.1911	0.1636	**0.4448**
P24	0.1333	0.1832	**0.4056**
P13	0.6236*	0.3298	0.4352*
P20	0.4222*	0.4893*	-0.0342
P6	0.3851*	0.5126*	0.1955
P3	0.3460*	0.6564*	0.1736
P7	0.1512	0.3940*	-0.4723*
P23	0.0662	0.4027*	0.3932*
P1	-0.0633	0.4702*	0.4268*

Note: Bold indicates significant loading at .01 with no cross-loading. Asterisks indicate a significant loading at .01 with cross-loading.

4.0 Findings

4.1 Factor A: Community Consultants

Factor A accounts for 17 percent of the explained variance and is defined by seven participants from six communities. These participants' experience of ES4SE TA was characterized primarily by their personal relationships and organizational capacity during program implementation (Table 3). Participants particularly appreciated the flexibility of the program structure (Statement 6: Rank 5) and the agility of program staff when responding to unanticipated pivots in community preferences and project approach (S28: 5). Participants frequently described these

experiences as part of the process of understanding individual community contexts and needs (S51, 4), especially in cases where projects or solutions were not initially well-defined. For example, one participant suggested:

> As we better understand the needs of the community, our approach to serving those needs will change … I cannot tell you how many agendas … how many projects there are where you get stuck on an idea, and it becomes a project for the sake of the project and not for the sake of the needs of the people (Participant 22).

Dedicating time to understanding communities without imposing a pathway or expectation for progress amplified participants' view of staff as being inclusive and supportive (S19, 4). This was particularly important when considering the limits of community or staff expertise, as well as the bounds of the TA program. This was exemplified by one participant who suggested:

> If [something] was outside the confines, then there was a discussion as to why … there was mutual engagement and value, not one above the other, and I think that's critical because that's not a historical thing … I feel like I had input to shape future conversations and some things were modified that reflected my input (P8).

As a result, participants felt they were "not going to be challenged or questioned" (P5) and suggested this "collegial conversation" (P8) demonstrated the "cultural sensitivity" of staff (P22). Moving the project at the speed of the community enabled trust-building (S34, 4), which participants hoped could be maintained beyond the duration of the TA program.

While these participants commended the dedication of program staff to understanding their community and providing "holistic support" (P22), they cited a lack of "time and staff capacity" (P4) to participate as much as desired or needed (S29, -5). In turn, three participants recognized the need for a "dedicated energy planner" (P4) within their community who could not only field technical questions but also help administer their agenda and navigate the political or economic landscape within the short timeline of the TA program (S7, -4). These organizational capacity issues were further complicated by the technology platforms (S8, -5) program staff used to conduct meetings (Microsoft Teams) and share files (Box). While participants appreciated how "patient [program staff] were with troubleshooting" (P4) and suggested "it did not disrupt things to the point of dysfunction" (P22), they advocated more familiar platforms (e.g., Zoom, Google Drive). Participants suggested use of familiar platforms would have increased program accessibility and productivity, especially when working with multiple partners.

Table 3. Defining statement ranks and Z-scores for factor A – Community Consultants.

	Statements most LIKE participants' TA experience	Z-score	Rank	Program Stage
6	The program was designed to be flexible and responsive.	**1.532**	5	Development
28	Program staff adapted their approach as my preferences and needs evolved.	1.512	5	Implementation
51	Program deliverables were tailored to my community needs.	1.409	4	Outcomes
19	Program staff were supportive and easy to work with.	1.373	4	Implementation

34	My relationship with program staff was built on trust and mutual respect.	**1.333**	4	Implementation

	Statements most UNLIKE participants' TA experience	Z-score	Rank	Program Stage
29	I had adequate time and resources to participate in this program.	**-2.123**	-5	Implementation
8	The technology used to facilitate program interaction was easy to use.	-1.998	-5	Development
40	I received the training I needed from this program.	**-1.668**	-4	Outcomes
7	The length of this program and level of support was sufficient to complete the scope of work.	**-1.628**	-4	Development
25	My community was actively engaged throughout this program.	-1.592	-4	Implementation

Note: Bold indicates distinguishing statement (sig at $p < .01$). Underlined indicates consensus statement (non-sig at $p > .05$). See Table A.1 in Appendix A for the full list of statement ranks for this factor.

In addition, these participants did not view training as part of the program or their individual SOW (S40, -4). In fact, one participant suggested training was antithetical to the collegial relationships and flexible approach built over the course of the program:

> Training is an interesting word … Training implies something a bit more regimented. This was a collaboration [whereas] training is more one-sided … a kind of relationship where one party is trained by the other … the more rudimentary the stage, the more training is helpful and necessary (P13[4]).

That said, several participants advised program staff to hold several informational sessions at the start of the program to ensure all participating communities could work from the same baseline knowledge.

Similarly, these participants did not view broader community engagement as part of the program or the role of program staff (S25, -4). Acknowledging their focus on conceptual development of projects, participants intentionally withheld input from a broader coalition of community members at this stage. They felt they needed to "show success before the community gets on board" (P11) through a "strong unified approach" (P5) or "demonstration project" (P8). Further, one participant acknowledged how the TA program "helped [them] see [they] have to do that" (P17).

In summary, participants in this factor prioritized the collaborative development of personal relationships and contextual knowledge. The extent to which specific deliverables were important was dependent on how they recognized and addressed the unique circumstances and historical legacy of place. While these participants offered a link to their community, they recognized a need for more conceptual and institutional work before the full impact of ongoing development could be realized.

[4] This participant loaded significantly on both factors A (0.62) and C (0.44), but this quote reflects a sentiment shared among participants within this perspective.

4.2 Factor B: Project Specialists

Factor B accounts for 16 percent of the variance and comprised six participants from five communities. Participants with this perspective tended to come to the TA program with a defined set of goals developed through strategic planning or other community energy planning processes (Table 4): for example, “The purpose for joining the program was to achieve certain aspects of our clean energy plan” (P9). As a result, statements that aligned with their experience were primarily focused on outcomes in applying the information gained during TA (S54, 4), and they valued the ability to share their ideas with staff (S33, 5) who incorporated their feedback throughout the program and were able to refocus aspects of TA that would meet their immediate and specific needs (S17, 4):

> I’m a person that wants to ask questions because I want to know how to figure out how we can benefit as a community, and [PNNL staff] were quite willing to allow for us to figure out some of those things and ask questions (P19).

Most participants viewed their TA experience through the lens of specialized informational, technological, or mechanical needs to get a project “off the ground.” Addressing those needs enabled participants to apply the information and skills gained through TA directly to a specific project:

> Once the technical and mechanical systems were explained, the pluses and minuses from an operational (and cost) standpoint, we have a much cleaner vision as to how to actually build the facilities that would provide the best benefit (P14).

Achieving community objectives through TA depends, in part, on the preparation of the participants, and the extent to which participants and program staff can define and align their expertise, agendas, and timelines to overcome capacity barriers prior to the program. The value of coming to the table with clear goals and expectations was mentioned by one participant:

> I have a technical background, so I was very clear on what TA was, how we were going to use this to leverage great scientists. While we didn’t have the capacity to focus on cutting-edge research, I think that gave us a leg up because we understood how to leverage the science, and it was very easy for us to dive deep into the questions we wanted answered (P17).

Conversely, some participants observed a disconnection between their expectations of the TA program and program design elements that prioritized aspects beyond simply relaying technical information. This is indicated by statements from participants who didn’t feel that the roles and responsibilities of program staff were clearly outlined (S4, -5), or the program activities were not adequately tailored to meet the needs of the community (S11, -4). This aspect “could have been done better” (P9) through early sessions to provide a clear “overview of what the process will look like, the different stages of working with TA, and then also what kinds of things will be asked of community participants so people can let their teams know and assess capacity” (P9). One participant described tensions between a “holistic view” (P14) of TA that included higher-level visioning activities and discussions of broader energy transition goals, and a focus on reaching technical solutions to immediate challenges and planning implementation. Spending time on activities that are not directly related to community needs can be particularly challenging for participants who lack the resources or capacity to spend the time on multiple phases of TA that may not be relevant for their goals:

> I think you need to break the two … design it in a 2-step process – one is more for visioning and one is more the actual project, the physical need you're trying to accomplish, and a technology that can deliver that. The technical aspects were there [but] more time discussing the pros and cons of some of those … would have got to the solution quicker (P14).

Despite this apparent tension between participants' expectations and program structure, several participants recognized the flexibility of the staff and how their ability to listen, incorporate feedback, and pivot accordingly was key to achieving valuable outcomes: "You reprioritized and reshuffled what I thought was important and what wasn't. Your staff were able to help focus what I was trying to do to make me more productive" (P10). However, another participant suggested there is a delicate balance between providing adequate structure to manage expectations and capacity and remaining flexible and adaptive to achieve the desired outcomes:

> I think it was done really deliberately on your end to be open-ended and leave the structure really open, but I think that sometimes left my team with too many decisions from the outset and a little bit of uncertainty. I think bringing in a structure that's flexible and allowing people to adapt as they go would have been more helpful (P9).

In summary, participants in this factor used TA to gain the technical direction necessary to initiate or complete specific projects. They had clear goals and expectations for what they wanted from the program; however, those needs were not necessarily discussed with program staff. The extent to which staff could remain flexible and adaptive to meeting the specific needs of these participants was a key quality that enabled the participants to gain the support they needed and learn how to successfully apply it to projects after the program.

Table 4. Defining statement ranks and Z-scores for factor B – Project Specialists.

	Statements most LIKE participants' TA experience	Z-score	Rank	Program Stage
33	I felt comfortable sharing my ideas, questions, and concerns with program staff	**1.853**	5	Implementation
42	I have a concrete vision for what to work on after this program	**1.710**	5	Outcomes
54	I am applying what I learned during this program	1.710	4	Outcomes
17	My input was encouraged, acknowledged, and incorporated throughout the program	**1.502**	4	Development
44	Technical assistance provided useful development options and pathways	**1.407**	4	Outcomes
	Statements most UNLIKE participants' TA experience	**Z-score**	**Rank**	**Program Stage**
8	The technology used to facilitate program interaction was easy to use	-2.195	-5	Development
4	The roles and responsibilities of program staff and participants were clearly outlined	**-1.345**	-5	Development
12	There was a productive balance between one-on-one support and cohort engagement	**-1.321**	-4	Development

11	Program activities were tailored to meet the needs of my community	**-1.319**	-4	Development
49	I learned how to better navigate the complexities of my local political and economic landscape	-1.285	-4	Outcomes

Note: Bold indicates distinguishing statement (sig at p < .01). Underlined indicates consensus statement (non-sig at p > .05). See Table A.1 in Appendix A for the full list of statement ranks for this factor.

4.3 Factor C: System Navigators

Factor C accounts for 11 percent of the explained variance and includes four participants across four communities. Participants with this perspective focused on experiences that affected power relationships, project ownership, and outcome feasibility (Table 5). Learning how to navigate interaction with political actors and affect policy defined participant experiences (S49, 5). Participants noted they were able to apply what they learned immediately (S54, 4) and take more control of political matters that directly affect their community: “We've been able to change the way the council and the regulators look at resilience. Instead of only the utilities defining what resiliency is, now we the community have defined [it]” (P2).

When describing their relationship with program staff, participants cited the balance of power as a critical factor for addressing community needs and achieving related program outcomes. Participants in this factor valued the responsiveness and adaptability of program staff (S28, 5). They felt this enabled a working relationship that empowered them to characterize their needs on/in their own terms and address what was important to their community (S11, 4; S19, 4). Participants referred to the dynamic with program staff as being an “interactive process where us, the community, tells program staff what we’re really looking for, then them listening to us and developing a tailored scope of work for our needs” (P15).

As a result, participants felt they had the power to “adapt and reshape” (P2) what they hoped to achieve within the program. This experiential emphasis on power not only affected how participants perceived their relationship with program staff, but also with other communities within the program cohort and external stakeholders. When discussing their relationship with program staff, participants focused on whether the desired outcomes were achieved, rather than the specific process of achieving them (S32, -4). For example, one participant downplayed the need to balance talking and listening and suggested: “the most important thing is that we got something out of the program” (P2). Other participants described a more nuanced and complex approach to power when external stakeholders were involved: “[Program staff] were more than willing to be in on the conversation with the utilities and walk us through some of the questions they had and clarify some of the answers the utilities had given” (P12).

Participants felt their progress was dependent on their unique socioeconomic and political context and suggested the time to learn with and from program staff was more valuable than their engagement with other communities in the cohort (S16, -5; S12, -5). In other words, participants felt working with program staff was more efficient and beneficial than navigating the different circumstances and goals of other communities, despite acknowledging their interest: “I think it's a great opportunity and you should keep [it] a possibility … but in our case, [our needs] were really so specific to the utility” (P15).

Participants felt their time during TA was “sacred” (1026) and regularly expressed a desire for more time and resources (S29, -4): “After we got our microgrid design options and the other

information that I really felt I wanted to get out of this and was necessary for the project moving forward, I had kind of depleted our budget for this" (P15).

Participant experiences were defined by their own contexts and needs. This inward focus meant they were hesitant to speak to or about the needs and experiences of others, including how their knowledge could be applied elsewhere:

> Those were just questions I couldn't answer [but] I think that is very important for a national lab to get a picture of what communities are dealing with locally and use that … to influence policy and grant opportunities (P2).

In summary, participants in this factor were focused on understanding and addressing challenges with institutional authority to achieve community-defined outcomes. They saw power as a product of the complex, hierarchal system they operate within and leveraged the program and relationships with other entities to help navigate and direct change.

Table 5. Defining statement ranks and Z-scores for factor C – System Navigators.

	Statements most LIKE participants' TA experience	Z-score	Rank	Program Stage
49	I learned how to better navigate the complexities of my local political and economic landscape.	**2.159**	5	Outcomes
28	Program staff adapted their approach as my preferences and needs evolved.	1.659	5	Implementation
11	Program activities were tailored to meet the needs of my community.	1.469	4	Development
19	Program staff were supportive and easy to work with.	1.457	4	Implementation
54	I am applying what I learned during this program.	1.241	4	Outcomes
	Statements most UNLIKE participants' TA experience	**Z-score**	**Rank**	**Program Stage**
16	Cross-community learning played a key role in this program.	**-2.761**	-5	Development
12	There was a productive balance between one-on-one support and cohort engagement.	**-2.166**	-5	Development
32	Program staff valued listening more than talking.	-1.466	-4	Implementation
38	The program provided mutual benefit to program staff and participant communities.	**-1.404**	-4	Outcomes
29	I had adequate time and resources to participate in this program.	-1.301	-4	Implementation

Note: Bold indicates distinguishing statement (sig at $p < .01$). Underlined indicates consensus statement (non-sig at $p > .05$). See Table A.1 in Appendix A for the full list of statement ranks for this factor.

4.4 Correlations and Community Overlap

While the factors represent three distinct perspectives among ES4SE participants, there was some overlap among them. The correlation among factors was highest for A and C (34 percent), whereas the correlation between A and B was equal to B and C (23 percent). In addition, factors

A and B shared participants from two of the same communities, and factors B and C shared participants from one community.

5.0 Lessons Learned and Recommendations

Characterizing and comparing different participant experiences provides insight into how to improve future community-based TA by tailoring the program design and related services to the needs and preferences of participating communities. ES4SE program participants offered lessons learned and recommendations based on their own experience, which are summarized below by program stage. In some cases, these insights reflect achievements that should be built upon, whereas in others they represent missed opportunities or institutional constraints.

5.1 Program Development

When evaluating their TA experience and looking toward future efforts, participants discussed four aspects of program design and project development: program promotion, program application, roles and responsibilities, and project scoping.

5.1.1 Program Promotion

TA programs like ES4SE often provide more holistic support than described in their marketing and application materials. Program participants, particularly within factors A and C, suggested program staff understated their capacity to address issues beyond energy storage, such as financing, workforce development, and policy challenges. Some participants acknowledged this may have been due to their general lack of knowledge or experience about what constitutes TA. To that end, participants desired more information about the technical capabilities and types of services that could be provided through TA. Similarly, multiple participants in factor A commended the cultural sensitivity of program staff, and advocated that staff highlight their experience working with indigenous and underserved communities when promoting future programs.

5.1.2 Program Application

ES4SE aimed to create an accessible and streamlined application process. Participants who contributed to their community's application appreciated the simplicity of the process and were encouraged by the low technical burden. That said, participants across all factors requested more specificity in the program description. They were particularly interested in the expertise of program participants that would be helpful (e.g., energy planner), the types of information or data to be collected (e.g., energy usage), and time commitment (e.g., one meeting every two weeks). While they recognized the importance of not placing barriers on participation, participants particularly within factor B suggested this specificity would ensure their knowledge and capacity fit the program expectations and streamlined data gathering at the start of the program. Similarly, a few participants in factors A and B identified an opportunity to use the application as mechanism to characterize the type of community and assess their technical readiness, which they suggested could help target specific TA needs and implementation approaches.

5.1.3 Roles and Responsibilities

For each participating community, program staff assigned one primary POC at the lab who was not part of the technical team. Participants across all factors saw this as critical to program success, suggesting it improved interpersonal relationships, enabled increased access to staff, and centralized progress tracking. Participants in factor A especially valued the consideration program leadership gave to selecting a POC who had existing experience with their type of community, citing improved understanding and efficient communication. Acknowledging the success of the staff POC and need to reduce capacity issues, multiple participants recommended assigning a community POC for each project task. Participants suggested this would increase the clarity of expectations and encourage discussion of what roles they could or should fill (e.g., project administrator, community liaison, technical consultant). In addition to the role of those within the program, participants also discussed the need to understand the role of external partners and the broader community in attaining project success. In some cases, participants invited external partners to program meetings to leverage existing analyses or projects, including other TA programs. Participants felt this level of coordination ensured community efforts were not duplicated and invited future TA programs to discuss existing work and partnerships during project scoping or while drafting a Memorandum of Understanding (MOU). Similarly, participants said it was important to outline preferences and timing for broader community engagement. While many participants suggested community engagement was not the role of the lab or the aim of TA, they felt addressing the topic early could inform their project scope and deliverables.

5.1.4 Project Scoping

Program staff and participants co-developed a SOW to outline project tasks and deliverables for each community. Given the amount of time that elapsed between program application and kickoff, some participants suggested using their application as a starting point for project scoping to explore how the community needs and vision may have shifted. Many participants cited a lack of familiarity with the format and appearance of an SOW and suggested an example or template would have streamlined planning. One participant whose community did not have a predetermined set of project tasks, recommended integrating an interactive brainstorming session into the scoping process to help understand task feasibility and prioritize different community needs. This suggestion echoed others, including those from factor C, who desired more time and feedback to understand the technical feasibility and risk (i.e., financial, political, environmental) of different energy development pathways. Participants, including those from factor B, pointed to the importance of a site visit during this period to ensure suitable system siting. In addition, most participants requested more upfront information about the format of deliverables (e.g., system design) planned by program staff and their purpose (e.g., equity analysis), so they could anticipate how to put them into practice. Similarly, many participants reflected on the uncertainty of whether they would receive Program and Project Development and Deployment Assistance (PDDA) program and how/where it could be applied to build their energy system. While participants acknowledged scoping was a learning process and commended program staff for their patience and flexibility, they desired a clearer understanding of the options for community-specific tasks and those planned by the technical team.

5.2 Program Implementation

When considering their participation and work with program staff, participants emphasized six areas that affected program implementation: program phases, communication, technology, meetings, webinars and workshops, and compensation.

5.2.1 Program Phases

Drawing on their experience with project scoping and how it translated into technical tasks, many participants advised future TA to create clearer distinctions between program phases. To this end, several participants from factors A and B distinguished goal visioning (e.g., concept development) from project planning (e.g., technical feasibility). Further, these participants suggested some communities may need to spend more time in one phase, and they advocated specific TA tracks focused only on visioning or planning. Regardless of the time spent in each phase, one participant recommended creating an interactive and/or visual way to track progress across program phases and specific tasks to catalyze work and related discussion. Looking ahead to PDDA, several participants expressed separation anxiety, citing the potential impact of losing relationships built during the TA phase and time needed to cultivate new ones. In response, they desired the opportunity to continue working with the same program staff, and/or involving the PDDA program staff in community meetings from the start of the program.

5.2.2 Communication

When discussing how their relationship with program staff was affected by communication, participants noted staff introductions, conversational turn-taking, and the presentation of technical information. Participants, particularly within factor A, acknowledged the cultural importance of introductions in building trusting relationships, and one participant advised staff to allocate more time at the start of any project to discuss who they are, where they are from, and who they are from. Others suggested more in-depth introductions would also give participants an opportunity to learn about the experience and capacity of technical staff that could be applied to their project. Across all factors, participants acknowledged staff sensitivity to conversational dynamics and valued opportunities to lead conversations and receive feedback or questions from program staff. A few participants recommended that program staff present a high-level introduction before presenting any technical information, especially in cases where attending participants did not have relevant expertise.

5.2.3 Technology

Participants regularly cited technology as a barrier to collaboration during the TA phase. Program staff used Microsoft Teams for video conferencing because it was the default software for their institution and Box for file sharing because community participants could create an account with their existing email. Participants were largely unfamiliar with these platforms and noted a preference for the applications they already used internally. The leading preferences included Zoom for video conferencing and Google Drive for file sharing. Participants suggested these platforms were more familiar, and many noted that Zoom required less bandwidth and Google Drive permitted real-time, collaborative document editing. In addition, program staff indicated email was sufficient and often preferred for questions, updates, and in some cases, file sharing.

5.2.4 Meetings

Engagement with community participants was primarily organized around weekly or biweekly virtual meetings with program staff assigned to their project. Most participants acknowledged the difficulty of attending their regular program meetings without affecting their full-time job. They suggested several ways to reduce the burden and recognized how responsive program staff were to these accommodations. Adjusting the length and frequency of the meetings, especially during different project phases (e.g., after scoping), was a common suggestion. For

example, common recommendations included holding weekly meetings for 30–45 minutes, biweekly meetings for 60 minutes, or fewer meetings scheduled around project tasks or milestones. In a related effort to reduce the time commitment, a couple participants recommended sending the meeting agenda at least two days before the meeting, so they could identify and prioritize which community members needed to attend the meeting. Similarly, another participant recommended ending each meeting with a task list to direct actions before the next meeting and, in the days leading up to it, determining whether the meeting should be postponed. While some participants noted the technical nature of the meetings often meant they lost sight of the overall SOW or program goals, most felt the structure and content of the meetings were productive.

5.2.5 Webinars and Workshops

ES4SE hosted multiple webinars and workshops throughout the TA phase to convene a subset of communities or the full cohort. Overall, participants valued these opportunities and offered some recommendations about their structure and content to improve their impact. Most participants preferred highly structured opportunities to learn and engage with a duration under 2 hours, and one participant recommended investing more effort in instructional design. Participants offered additional webinar topics they said would improve their knowledge and capacity, including an overview of energy storage, energy equity, grid integration, and public/private funding mechanisms. They encouraged program staff to schedule these opportunities earlier in the program. They suggested hosting overview webinars early in the program would provide critical baseline knowledge and vocabulary the cohort could share. For technical workshops, participants wished they had had more time to apply their knowledge and generate targeted questions. In addition to webinars and workshops, the ES4SE program hosted an informal weekly opportunity for communities to engage and network with each other. While not all participants attended these optional cohort meetings, they preferred meetings that included project presentations from communities or topic overviews from invited speakers, and they suggested this structure helped build actionable discussion. In turn, they recommended changing the frequency to biweekly or monthly, using this venue to host informational webinars at the start of the program, and constructing smaller cohort groups to continue addressing shared opportunities and challenges.

5.2.6 Compensation

While the ES4SE program did not provide financial assistance, participants identified multiple mechanisms to further support their participation and alleviate capacity issues. Multiple participants requested financial compensation for facilitating meetings, presenting at invited panels, hosting site visits in their community, and/or visiting the lab. Another mechanism suggested by several participants was paid internships. These participants suggested interns could act as community liaisons, alleviate administrative burdens, and gain technical expertise from the lab. Participants suggested interns could be funded internally by the lab or through external programs (e.g., AmeriCorps).

5.3 Program Outcomes

When addressing the legacy of program deliverables and outcomes, participants pointed to three topics: network maintenance, attribution and distribution, and knowledge management.

5.3.1 Network Maintenance

Community participants expressed a desire to maintain their relationship with program staff, particularly their nontechnical POC, and the lab network after the program period. Several recommended allocating a small proportion of lab or program funding to long-term community engagement, which they suggested could operate informally (e.g., occasional 15-minute phone call, email listserv) or formally (e.g., lab network, community liaisons). In turn, participants indicated this might help them navigate different opportunities and reduce the number of engagement requests. Similarly, one participant felt their TA experience and related technical expertise could be used to support other organizations or communities in their region and advocated the creation of a TA network where past TA recipients could provide paid consulting for new ones. Highlighting the importance of relationship maintenance during the program period, another participant acknowledged the negative impact of technical staff turnover. This participant advised lab leadership to ensure technical staff understood and valued the nuances of community-based work and provide them with adequate support for working with communities.

5.3.2 Attribution and Distribution

A few participants acknowledged tensions around the attribution and distribution of ideas and materials throughout the TA program. These tensions concern the historical legacy of resource extraction from disadvantaged communities and the desire to scale energy development solutions sustainably and equitably. Participants recommended addressing these issues early (e.g., in the application, during scoping), for example through an MOU, and returning to them when developing and reviewing project deliverables. They suggested this would help ensure (1) the community has a clear understanding of and authority over what information is shared publicly, (2) attribution or authorship adequately represents the individual and collaborative contributions, and (3) distribution of project outcomes reaches the appropriate audiences. In turn, these participants hoped their knowledge and experience would catalyze future research and practices they could lead.

5.3.3 Knowledge Management

Recognizing the short duration of the TA, participants across all factors identified opportunities to safeguard the knowledge and resources they gained. For existing deliverables, participants desired more instruction or documentation, whether that was a user guide on how to use or adapt the technical models and equity analysis or formal language about their participation in the ES4SE program to leverage in future applications. When discussing work after the program, many participants from factors A and B reported uncertainty about next steps either due to resource or capacity concerns, and a few wanted a roadmap to direct future action without support from program staff. To begin addressing these concerns and evaluating project sustainability after TA is completed, several participants recommended establishing a mechanism for monitoring community progress (e.g., periodic phone call, survey). They suggested this would provide critical information about the success of knowledge transfer and the feasibility of different project designs.

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Appendix A – Supplemental Data

Table A.1 in Appendix A includes the full statement set used for data collection and analysis, as well as the average statement rank and Z-score per factor, which enables comparison across each factor.

Table A.1. Average statement rank and Z-score per factor.

			Factor A		Factor B		Factor C	
	Statement	Program Stage	Z-score	Rank	Z-score	Rank	Z-score	Rank
1	The program application process was open-ended and accessible.	Development	-1.299	-3	**0.800**	2	-1.093	-3
2	The goals of this program were clearly communicated.	Development	0.433	1	**-1.153**	-3	0.461	1
3	The design of this program was aligned with its goals.	Development	0.430	1	**-0.935**	-2	0.003	0
4	The roles and responsibilities of program staff and participants were clearly outlined.	Development	-0.201	-1	**-1.345**	-5	-0.171	-1
5	Program staff clearly explained whether certain needs could be met through program services.	Development	0.080	0	-0.297	-1	**1.043**	3
6	The program was designed to be flexible and responsive.	Development	**1.532**	5	**-0.530**	-1	**0.531**	1
7	The length of this program and level of support was sufficient to complete the scope of work.	Development	-1.628	-4	-1.020	-2	-0.407	-1
8	The technology used to facilitate program interaction was easy to use.	Development	-1.998	-5	-2.195	-5	**-0.910**	-2
9	The program design accounted for the diversity of participant communities.	Development	**1.110**	3	-1.241	-3	-0.652	-2
10	*The amount of administrative and technical work was well-balanced.	Development	-0.795	-2	-1.156	-3	-1.016	-3
11	Program activities were tailored to meet the needs of my community.	Development	1.121	3	**-1.319**	-4	1.469	4
12	There was a productive balance between one-on-one support and cohort engagement.	Development	**-0.353**	-1	**-1.321**	-4	**-2.166**	-5

			Factor A		Factor B		Factor C	
	Statement	Program Stage	Z-score	Rank	Z-score	Rank	Z-score	Rank
13	Program meetings were well-coordinated and productive.	Development	**0.110**	0	-1.058	-2	-0.905	-2
14	Program staff shared my vision for the future of my community.	Development	**-0.517**	-1	0.397	1	0.272	0
15	I shaped the technical assistance process and activities.	Development	**-0.074**	-1	**1.176**	3	**-1.251**	-3
16	Cross-community learning played a key role in this program.	Development	0.140	0	-0.463	-1	**-2.761**	-5
17	My input was encouraged, acknowledged, and incorporated throughout the program.	Development	**0.814**	2	**1.710**	4	**0.018**	0
18	This program is a model that should be used for future community technical assistance.	Development	1.307	3	**-0.477**	-1	0.754	2
19	*Program staff were supportive and easy to work with.	Implementation	1.373	4	1.206	3	1.457	4
20	*Program staff were responsible with my time.	Implementation	0.302	1	0.245	0	0.113	0
21	Program content was delivered in a way that was clear and easy to understand.	Implementation	-0.011	0	0.118	0	**1.145**	3
22	*The program leveraged people with the expertise needed to support my community.	Implementation	0.965	2	0.588	2	0.558	1
23	Program staff were committed to understanding the cultural context of my community.	Implementation	**0.728**	2	-0.363	-1	-0.429	-1
24	Technical assistance was a process of collaboration and co-creation.	Implementation	0.567	1	0.941	3	-0.151	-1
25	My community was actively engaged throughout this program.	Implementation	-1.592	-4	-0.754	-1	-1.156	-3
26	Program staff leveraged existing resources and efforts in my community.	Implementation	0.652	2	**-1.216**	-3	-0.101	0
27	*Program staff were committed to maintaining the privacy and security of sensitive information.	Implementation	-0.369	-1	0.139	0	0.163	0

			Factor A		Factor B		Factor C	
	Statement	Program Stage	Z-score	Rank	Z-score	Rank	Z-score	Rank
28	Program staff adapted their approach as my preferences and needs evolved.	Implementation	1.512	5	**0.371**	1	1.659	5
29	I had adequate time and resources to participate in this program.	Implementation	**-2.123**	-5	-0.844	-2	-1.301	-4
30	Program staff appropriately responded to challenges that emerged during the program.	Implementation	1.304	3	1.027	3	0.556	1
31	Program staff explained the broader applicability of the work they conducted with my community.	Implementation	-0.582	-2	-1.279	-3	-0.925	-2
32	Program staff valued listening more than talking.	Implementation	-0.853	-2	**0.563**	1	-1.466	-4
33	I felt comfortable sharing my ideas, questions, and concerns with program staff.	Implementation	**0.179**	0	**1.853**	5	**-0.723**	-2
34	My relationship with program staff was built on trust and mutual respect.	Implementation	**1.333**	4	0.308	1	0.341	1
35	Program staff upheld the principles of equity and inclusion.	Implementation	1.238	3	-0.094	0	0.582	2
36	Transparency and accountability were important aspects of this program.	Implementation	0.277	1	**-0.583**	-1	0.449	1
37	*This program met its original goals.	Outcomes	-0.002	0	0.307	1	-0.036	0
38	The program provided mutual benefit to program staff and participant communities.	Outcomes	0.068	0	0.283	0	**-1.404**	-4
39	The program provided meaningful answers to the questions I had at the start of the program.	Outcomes	**-0.117**	-1	0.828	2	1.230	3
40	I received the training I needed from this program.	Outcomes	-1.668	-4	-1.027	-2	-0.729	-2
41	My understanding of technical assistance and related opportunities has improved.	Outcomes	0.489	1	0.118	0	-0.204	-1
42	I have a concrete vision for what to work on after this program.	Outcomes	-1.386	-3	**1.715**	5	-0.618	-1
43	This program increased my engagement with community partners.	Outcomes	-1.486	-3	-0.960	-2	-0.196	-1

			Factor A		Factor B		Factor C	
	Statement	Program Stage	Z-score	Rank	Z-score	Rank	Z-score	Rank
44	Technical assistance provided useful development options and pathways.	Outcomes	**-0.374**	-1	**1.502**	4	**0.592**	2
45	Program staff provided useful technical analyses and/or models.	Outcomes	0.427	1	1.407	3	0.872	2
46	Program staff provided helpful feedback on existing plans or proposals.	Outcomes	**-0.773**	-2	0.572	1	1.111	3
47	*Program staff helped me translate and interpret technical information.	Outcomes	0.074	0	0.111	0	0.152	0
48	I personally had an impact on project outcomes.	Outcomes	**-0.859**	-3	0.932	2	0.672	2
49	I learned how to better navigate the complexities of my local political and economic landscape.	Outcomes	-1.552	-3	-1.285	-4	**2.159**	5
50	This program addressed pressing issues that my community faces.	Outcomes	0.929	2	0.710	2	**-0.939**	-3
51	Program deliverables were tailored to my community needs.	Outcomes	1.409	4	0.715	2	0.956	3
52	The ability of my community to enact change was improved.	Outcomes	**-0.666**	-2	0.115	0	0.565	1
53	I gained access to new resources and opportunities that my community can leverage.	Outcomes	1.067	2	0.450	1	0.591	2
54	I am applying what I learned during this program.	Outcomes	**-0.692**	-2	1.710	4	1.241	4

Note: Rank and Z-score data represent the average weighted sorts per factor. Asterisks indicate consensus statements that are non-significant at $p > .05$. Bold indicates distinguishing statements that are significant at $p < .01$.

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