Pacific Northwest
NATIONAL LABORATORY

Guidance for Integrating Energy Justice and Equity in Building Technology Deployment Programs:

Tracking, Reporting, and Maximizing the Flow of Benefits from Building System Technology Deployment Activities to Disadvantaged Communities and Target Sectors

Version 1.0

Introduction	Identify Benefits, Goals, and Target Sectors	Measure Flow of Benefits	Engage Stakeholders	Report and Continuous Improvement	References

PNNL-35548

Authors and Acknowledgements

Authors

Elsie Puig-Santana,
Pacific Northwest National Laboratory
elsie.puig@pnnl.gov

Kasey Johnston,
Pacific Northwest National Laboratory
kasey.johnston@pnnl.gov

Kate Hickcox,
Pacific Northwest National Laboratory
kathryn.hickcox@pnnl.gov

This publication is the **first version** of a guide written to help building system technology deployment programs meet energy justice and equity goals as proposed by the Justice40 Initiative. We have designed it as a living document intended to be periodically updated to incorporate stakeholder feedback and new developments. **We welcome feedback** as teams apply these approaches and best practices in their own work. Feedback is critical in improving and expanding future versions of this guide. Please reach out to the authors with comments, questions, or feedback at EJE.BUILDINGS@pnnl.gov.

The authors acknowledge the equity and justice professionals who spent countless hours discussing and reviewing this work, including Amanda Dwelley, Sergio Castellanos, Ivory Mayhorn, Stephany Vaioleti, and Angie Jean-Marie. Their feedback changed the way we thought about how building technology deployment programs can contribute to an equitable energy future for communities. Thank you to our current and prior sponsors and champions in the Building Technologies Office, including Hayes Jones, Mariana Egea-Casalduc, Carly Peltier, Billierae Engelman, and Carys Behnke. The authors would also like to thank Pacific Northwest National Laboratory colleagues Ebony Mayhorn, Quanah Spencer, Corey Strachan, Ennea Fairchild-Grant, Christian Valoria, Axel Pearson, and Linda Sandahl for their expert contributions and technical reviews, and Anita Waller for editing assistance. Thank you to Eliot Crowe of Lawrence Berkeley National Laboratory and Mahabir Bhandari of Oak Ridge National Laboratory for their enthusiasm and support of this project. Thank you to Kelsea Dombrovski of National Renewable Energy Laboratory for her thorough and thoughtful review and comments. The authors would like to give a special thank you to Lin Zeng and Lauren Esaki-Kua for their thoughtful contributions to the research and detailed reviews and comments.

Cover Image: MidJourney

Disclaimer

PACIFIC NORTHWEST NATIONAL LABORATORY

operated by BATTELLE

for the UNITED STATES DEPARTMENT OF ENERGY

under Contract DE-AC05-76RL01830

Printed in the United States of America

Available to DOE and DOE contractors from the Office of Scientific and Technical Information,

P.O. Box 62, Oak Ridge, TN 37831-0062

www.osti.gov

ph: (865) 576-8401

fax: (865) 576-5728

email: reports@osti.gov

Available to the public from the National Technical Information Service

5301 Shawnee Rd., Alexandria, VA 22312

ph: (800) 553-NTIS (6847)

or (703) 605-6000

email: info@ntis.gov

Online ordering: http://www.ntis.gov

Contents

Figures

Tables

Equations

Acronyms and Abbreviations

BTO	Building Technologies Office
CBI	Commercial Buildings Integration
CEJST	Climate and Economic Justice Screening Tool
DAC	Disadvantaged Community
DOE	U.S. Department of Energy
EJE	Energy Justice and Equity
EJED	Energy Justice and Equity in Deployment project
EJE-BEST	Energy Justice and Equity in Building Energy Systems Technology deployment and reporting tool
EERE	Energy Efficiency and Renewable Energy
EO	Executive Order
IRB	Institutional Review Board
J40	Justice40 Initiative
J40 benefits	Justice40 benefits
PNNL	Pacific Northwest National Laboratory
UIB	Underinvested Building

Selected Definitions

Aligned Justice40 Goals (J40 Goals) – Program Goals that are aligned with the priorities laid out in the Justice40 Initiative, and potentially other agency or U.S. Department of Energy office level priorities. The aligned J40 program goal is synonymous with the J40 program benefit, since the program aims to achieve these goals within the target sectors or stakeholder groups, so that they can benefit from the technology deployment.

Community Asset Building or Installation – "Local Institutions, which include institutions that reach into the community, such as businesses that create local job opportunities, social service agencies, health services (hospitals and clinics), libraries, schools (children and adult schools), colleges or universities" [1].

Disadvantaged Community – United States Office of Management and Budget's Interim Implementation Guidance defines a community as "either: (1) Geographic: a group of individuals living in geographic proximity (such as census tract), or (2) Common condition: a geographically dispersed set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions" [2]. For the "geographic" definition of community, pursuant to the Interim Implementation Guidance and U.S. Office of Management and Budget guidance M-23-09, U.S. Department of Energy recognizes as disadvantaged those census tracts identified by the White House Climate and Economic Justice Screening Tool (CEJST), which is located at https://screeningtool.geoplatform.gov/. For the "common condition" definition of community, Federally Recognized Tribal lands and U.S. territories are categorized as disadvantaged in accordance with OMB's Interim Implementation Guidance [3].

Justice40 Benefits - Justice40 benefits manifest when funds or resources invested in a program, flow through the program components, and directly support the program's aligned Justice40 goals (e.g., programs using funding to provide technical assistance that supports the Department of Energy Building Technologies Office deployment program aligned Justice40 goal of accelerating the adoption of efficient building technologies within the target sectors or populations).

Program Component - Program components are elements, or sub-tasks of a program that have unique outcomes. Examples of program components include project management, administration, knowledge development (e.g., developing case studies), stakeholder engagement, work to support a recognition program, or travel.

Systems Technology Research and Development - Focuses on buildings systems efficiency and optimization, and validation and experimentation to support the development and optimization of technology packages and building components [15].

Target Sector - A target sector is either a group of building types or a group of stakeholders at which the deployment program aims its efforts and resources. A target sector is a subset of the larger commercial or residential building sector.

Underinvested Building – Buildings in which insufficient money or resources is spent over a long period of time. Definition and criteria to be determined by each program in lieu of a U.S. Department of Energy definition.

Document Overview

This guide and the accompanying Energy Justice and Equity in Building Energy Systems Technology (EJE-BEST) deployment and reporting tool, which were funded by the Building Technologies Office (BTO) of the U.S. Department of Energy (DOE), support building system technology deployment teams in tracking, reporting, and maximizing the flow of benefits from BTO deployment activities to disadvantaged communities (DACs), underinvested buildings (UIBs) and target sectors. This is a living document. Pacific Northwest National Laboratory (PNNL) intends to continue to modify and improve both the document and the accompanying EJE-BEST deployment and reporting tool as new information becomes available and in response to user feedback. Feedback is important, please provide thoughts and suggestions to the authors.

The methodologies in this document are intended to align with the *M-21-28 Interim Implementation Guidance for the Justice40 Initiative*, the *DOE General Guidance for Justice40 Implementation Version 1.1*, and the *Justice40 Community Benefits Plan* resources [2] [4] [5]. This guide may also support DOE Office of Energy Efficiency and Renewable Energy (EERE) data gathering efforts which are outlined in the *EERE Impact Evaluation Method Guide for Justice 40, Equity, and Workforce Diversity Goals* [6]. The EERE guide aims to answer the question: "In the aggregate, are EERE's $2B J40[1]/DEIA[2]/ workforce investments creating expected changes in early- and end-stage outcomes and providing evidence of having impacts?" [6]. The methodologies proposed in this document and the EJE-BEST tool allow BTO deployment programs to track, report, and share energy justice and equity (EJE) impacts, and Justice40 metrics and best practices, with program sponsors. The EJE-BEST tool also includes inputs to help identify if the program would be relevant for the EERE impact evaluations [6].

This guide outlines steps that can be taken to holistically integrate EJE into deployment activities, and the companion EJE-BEST tool supports the implementation of the guidance and best practices.

[1] https://www.energy.gov/justice/justice40-initiative

[2] Diversity, Equity, Inclusion, Access (DEIA)

Image Credit: Design Trust for Public Space
'Opening the Edge' Community Design Meeting

Getting Started

The process of integrating EJE holistically into building technology deployment programs will look different for every team, but in most cases, it will take additional time and resources. This document lays out a set of strategies, metrics, and best practices that can be implemented over time to apply EJE approaches, whether the program is just starting out or ongoing. These metrics and best practices do not need to be implemented at the same time; teams can start with improving EJE in any area of their program. Regardless of where a team chooses to focus their initial EJE improvement process, it is recommended that teams start by first determining the flow of Justice40[3] benefits to target sectors (see section Identify Flow of Justice40 Benefits to Target Sectors) and then filling out the EJE-BEST tool to set a baseline for the team and the program.

Be sure to consider the EJE goals, metrics, or best practices that the team plans on incorporating into the program while developing DOE funding proposals, as additional time and resources will be required to adopt new approaches. As the team incorporates these new approaches, regularly track progress in the EJE-BEST tool.

Teams can use the EJE-BEST tool and resulting reports to review which metrics and best practices are already being implemented and those that have not yet been applied. Any of the metrics or best practices that have not yet been implemented into the program are opportunities to enhance equitable outcomes of the program. Teams can use the tool to identify which metrics or best practices to start working on for next steps. Remember to maintain a collaborative spirit throughout these efforts. Focus on centering stakeholder voices in all aspects of deployment programs, recognizing the value of their insights. Connect with individuals and teams working on advancing EJE both internally and externally to the organization. This work is not just about checking boxes and meeting program milestones; it is about creating positive change, so make it happen!

Figure 1 The Four Main Elements of the Energy Justice and Equity Approach

[3] https://www.energy.gov/justice/justice40-initiative

Introduction to Energy Justice and Equity

Whether kicking off a new program or in the middle of a multi-year effort, familiarizing the team with EJE history and principles can provide a firm foundation for achieving more just and equitable outcomes. Building on this foundation, recent years have seen significant advancements in EJE initiatives. The Biden administration has bolstered the foundational efforts of Executive Order (EO) 12898 titled, "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations". This 1994 order aims to address the disproportionately high environmental and health risks faced by minority and low-income communities by directing federal agencies to identify and mitigate the effects of their actions on communities, promote environmental justice through policies and programs, and foster public participation in decision-making processes [7].

In 2021, President Biden issued EO 14008 "Tackling the Climate Crisis at Home and Abroad," which established the Justice40 Initiative. The Justice40 Initiative (J40) directs at least 40% of the overall benefits of certain federal investments flow to DACs [8]. Federal government programs that direct investments toward climate change, clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, remediation and reduction of legacy pollution, and the development of critical clean water and wastewater infrastructure are considered "covered programs" that fall under the scope of the Justice40 Initiative. In addition to directing at least 40% of the overall benefits to DACs, all Justice40 covered programs are required to consult community stakeholders to co-develop program benefits, and to track and report the flow of benefits to DACs [9]. By prioritizing EJE, J40 aims to address current and historical disparities by ensuring that benefits are effectively delivered to DACs.

All programs under DOE's Office of Energy Efficiency and Renewable Energy are covered under Justice40. In addition to meeting the goals set forth by the Justice40 Initiative, DOE has committed to ensuring that each Justice40 covered program "maximizes benefits to communities while also identifying and addressing potential harms to communities that may result from DOE-funded programs," and incorporating the elements of energy justice into DOE programs, projects, and funding opportunities.

~DOE Office of Energy Justice and Equity,

Justice40 Initiative Environmental Justice Fact Sheet

In 2023, EO 14096 titled "Revitalizing Our Nation's Commitment to Environmental Justice for All" established a policy to pursue a whole-of-government approach to environmental justice. The order directs agencies to address disproportionate and adverse human health and environmental effects, risks, and hazards of federal activities by identifying and mitigating historical inequities and systemic barriers related to federal policies and programs, increasing the ability of communities with environmental justice concerns to receive equitable access to human health and environmental benefits from federal activities, supporting the creation of high-quality, well-paying jobs for people who are part of communities with environmental justice concerns, and enhancing meaningful engagement of persons and communities with environmental justice concerns who are potentially affected by federal activities [10].

"Historically, low-income communities and communities of color have been disproportionately affected by pollution, extreme weather events, and other environmental impacts of fossil fuel generation. Therefore, these disadvantaged communities stand to benefit the most from access to renewable energy technologies, energy efficient housing, and low-carbon transportation options" [12]. A focus on energy justice and equity policies, programs, and investments is key to distributing the benefits and burdens of the energy system equitably and remediating burdens (social, economic, health-related) on those who are disproportionately harmed by the energy system, while also giving them the opportunity to influence the processes that govern the energy system and related research design, development, and deployment (RDD&D) programs [13]. To address these facts, and incorporate feedback received during DOE's BTO fiscal year 2021 Peer Review, PNNL established a BTO-funded Systems Technology Energy Equity and Justice (ST-EEJ) Working Group of systems technology researchers from national laboratories (PNNL, Lawrence Berkeley National Laboratory, National Renewable Energy Laboratory, and Oak Ridge National Laboratory) working on building technology deployment programs targeted at commercial buildings. PNNL also established a diverse advisory group of energy justice and equity leaders to advise the ST-EEJ Working Group. The external advisors have worked closely with the ST-EEJ Working Group from the early -stages of various programs to review, inform, and provide feedback on direction.

While BTO deployment programs have well-defined goals related to deployment of building technologies, many of the goals and methods used to reach them have been developed with early adopters in mind. To better align with the focus on DACs, the ST-EEJ Working Group engaged in a series of discussions to clarify and address questions such as:

- What are the overall goals of our programs and are they equitable?
- How can the benefits and goals be improved to be more equitable and just?
- What benefits do the programs offer to DACs, UIBs or other EJE target sectors?
- How do we calculate the percent of benefits reaching target sectors?

What followed was engaging dialogue and ongoing collaboration between advisors and research teams on the challenges, opportunities, and visions for centering justice and equity in clean energy deployment activities. The discussions underscored the importance of a shared approach to integrating energy justice and equity into building technology deployment programs.

Direction from the White House, DOE, and EERE Action

Section IV of M-*21-28 Interim Implementation Guidance for the Justice40 Initiative*, entitled "Calculating Benefits" states that "each agency should establish a methodology for calculating the benefits that a) flow from each applicable covered program and b) accrue in disadvantaged communities from each covered program" [4]. **"The determination of what constitutes a 'benefit' will vary by covered program.** Accordingly, each agency is directed to... deliver to [White House Office of Management and Budget] a methodology for calculating the covered program benefits accruing to disadvantaged communities. This methodology should also include a description of the metrics that the agency is developing to measure covered program benefits" [4]. DOE issued general guidance for Justice40 Implementation, which offers a series of metrics that could be used to calculate the eight (8) policy priorities of Justice40 (see section Aligned Program Goals and Benefits), but doesn't offer specific metrics or methodologies for tracking the benefits that support those priorities, nor does it suggest best practices for maximizing the flow of benefits to DACs [2] [5]. EERE has also published an impact evaluation method guide for tracking EERE's progress toward Justice40, equity, and workforce diversity goals. The methodologies laid out in this document aim to track and evaluate the impacts of EERE investments in a series of target populations or sectors [6].

The EJE-BEST gathers data on specific groups and industries within the EERE target populations. This data helps to determine whether a program contains valuable information for EERE efforts.

In lieu of a specific methodology and a set of practical steps for applying Justice40 to BTO deployment programs, PNNL launched an Energy Justice and Equity in Deployment (EJED) project to develop practical guidance for making building technology deployment programs more equitable and just. Early work on this project focused on exploring existing programmatic frameworks for enhancing equitable outcomes. One of the most influential of these frameworks was detailed in the University of Michigan's Energy Equity Project Report [14]. A number of the metrics and best practices featured in this document were inspired by the University of Michigan framework and amended to fit the context of energy technology deployment programs, while others came from the collective knowledge and best practices from the EJED teams' research, and input from an advisory group of equity and justice professionals.

The EJED project teams' work started with a focus on incorporating energy justice and equity approaches and J40 directives into PNNL's Integrated Lighting Campaign (ILC) as a case study. The EJED team worked closely with the ILC project manager and team as well as BTO commercial building and residential building integration teams and other EJE experts at PNNL, Lawrence Berkeley National Laboratory, Oak Ridge National Laboratory, and National Renewable Energy Laboratory while developing the guidance and best practices compiled here. The guidance has also been developed with the support of the "boots on the ground" external energy justice and equity advisors from the Systems Technology Energy Equity and Justice Inter-laboratory Working Group and EJE experts from the BTO office. As feedback is received and more teams use the document, the guidance within this document, along with the accompanying EJE-BEST tool, will continue to evolve.

In lieu of a specific methodology and a set of practical steps for applying Justice40 to BTO deployment programs, PNNL launched an Energy Justice and Equity in Deployment project to develop practical guidance for making building technology deployment programs more equitable and just.

Many of the metrics and best practices outlined in this guidance document are being applied using the Integrated Lighting Campaign as a case study.

Image Credit: Boys & Girls Club of the Twin Cities, Jerry Gamble and Southside Village Clubs in Minneapolis, MN recognized by the ILC in 2023 in the Energy Justice, Diversity, Equity, and Inclusion category.

Energy Justice and Equity in the Department of Energy

Energy justice builds on the framework of environmental justice approaches and principles [15]. DOE defines energy justice as "the goal of achieving equity in both the social and economic participation in the energy system, while also remediating social, economic, and health burdens on those disproportionately harmed by the energy system," and acknowledges four tenets of energy justice: procedural justice, distributive justice, recognition justice, and restorative justice, as detailed in Table 1 [11] [16] [17] [18] [19] [20] [21] [22] [4]. Recently, the scope of energy justice has been expanded to include a fifth tenet, cosmopolitan justice. Cosmopolitan justice seeks to identify and address inequalities throughout the entire life cycle of the energy system, from raw material extraction through end of life [17] [23] [24]. While DOE hasn't officially recognized cosmopolitan justice yet, each of these five energy justice tenets could be incorporated into BTO-funded programs to improve program outcomes and minimize negative effects on DACs.

Table 1 The Five Tenets of Energy Justice and Equity

Procedural Justice	Assuring "meaningful participation in decision-making"
	Example: Stakeholder input to inform program throughout the program life cycle
Distributive Justice	Assuring "the benefits and burdens of DOE-funded projects are equitably distributed"
	Example: Community benefits plan is developed in partnership with community stakeholders
Recognition Justice	"Understanding the history and context of DOE-funded project development"
	Example: Determine whether a proposed project or program would create additional positive or negative social or environmental effects within the local community
Restorative Justice	"Facilitating healing and harmony through DOE-funded project activity"
	Example: Repair and improve environmental and social conditions within communities
Cosmopolitan Justice	Identifying and addressing inequities throughout the entire life cycle of the energy system
	Example: Using life cycle thinking or life cycle assessments to uncover environmental justice or social effects thorough every stage from manufacturing to disposal or reuse

[4] The quotes in Table 1 are taken from the Justice40 Initiative Environmental Justice Fact Sheet [11].

Program Budget Considerations

Applying the guidance and best practices in this document, along with using the EJE-BEST deployment and reporting tool, will require additional time and budget. While it is not necessary to implement all metrics and best practices simultaneously, familiarizing team members with the terminology, approaches, tools, and best practices will require dedicated time and resources. This guidance document, coupled with the EJE-BEST tool, are meant to support the implementation of energy justice and equity approaches by providing examples and suggestions. However, effective use will require teams to discuss and determine program goals, benefits, and target sectors, as well as tailoring approaches and practices to the specific context of their program. These discussions, which require time and resources, are crucial for optimal implementation of best practices.

Furthermore, the J40 Initiative requires that all covered federal programs consult stakeholders to determine program benefits. This involves ongoing stakeholder feedback sessions throughout the duration of the program, especially during program setup so that program plans can be aligned with stakeholder needs. Consultation is time-consuming and requires the implementation of many of the best practices listed in the Communications and Outreach Best Practices section. Communications and outreach experts on the team will need time to familiarize themselves with the recommendations and to determine what approaches will work best for the program. Teams may consider sending team members to in-person to events for direct engagement with key stakeholders.

"The word justice can both softly roll into the air and echo with thunderous force across a nation. It has a unique power that carries history just as easily as it can carry people towards hope, togetherness, and action. It is a power so large and momentous, one wonders why it hasn't been deployed with more force as a solution to the greatest threat we face - the climate crisis".

~DOE Office of Energy Justice and Equity,

How Energy Justice, Presidential Initiatives, and Executive Orders Shape Equity at DOE

Centering Stakeholder Voices in all Aspects of Deployment Programs

First and foremost, the development of a holistic approach to program design that includes EJE and maximizes the flow of benefits to DACs and target building sectors must reflect the voices and priorities of stakeholders from those communities. Together, stakeholders from DACs or target sectors and team members from BTO programs will identify and prioritize benefits and refine metrics and methods to track and report the benefits that flow from the program to DACs. Although a deployment team cannot determine program benefits without the input of all relevant stakeholders[5], including DACs, it is advisable for teams to begin a conversation with stakeholders with a proposed set of program benefits and desired outcomes already prepared. This will allow everyone involved to collaborate more easily on final program benefits and activities. The EJED project team identified two high-level concepts that can enable stakeholders' voices to meaningfully contribute to deployment programs:

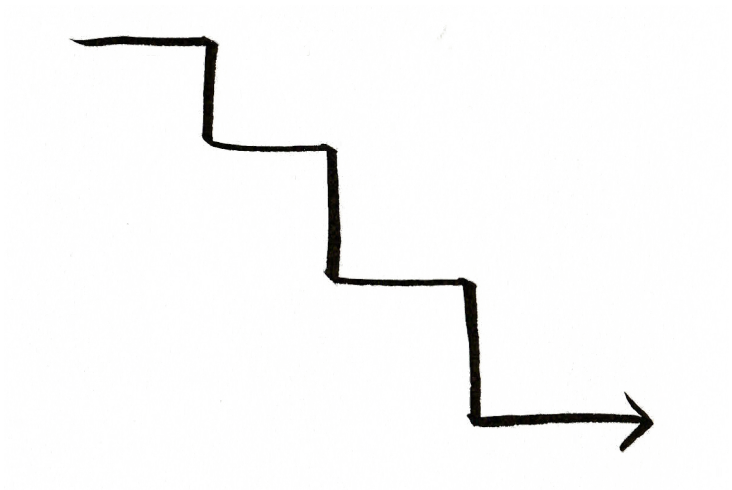
- **Agile vs. Waterfall Communication[6],**
- **Participatory Program Design.**

[5] See section Stakeholder Engagement for more information on identifying relevant stakeholders.

[6] See Figure 2

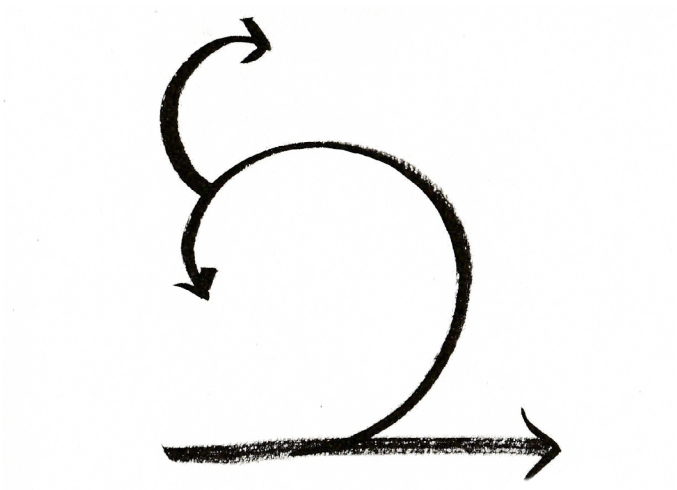
Image Credit: Design Trust for Public Space
'Opening the Edge' Community Design Meeting

Waterfall vs. Agile Communication



Waterfall Communication

Program planning or communication in a waterfall model typically entails completing one program phase before progressing to the next, without revisiting or addressing outcomes of previous steps. This approach is characterized by upfront planning of distinct phases. It is particularly suitable for programs with stringent regulations or requirements, as the procedures and deliverables of each phase help assure compliance with set standards [26]. Most programs and activities from DOE likely follow a waterfall communication scheme, where information or requirements flow down from the federal government to state offices, and then to local communities. With this approach, many local communities and state offices do not have the pathways or opportunities to provide feedback to the federal offices about how the programs are working (or not working) at the local level [27].



Agile Communication

In contrast, agile communication or program planning involves continuously gathering feedback and adjusting on smaller, more manageable program components. Because many DOE programs follow strict predetermined timelines and deliverables, it may not be possible to fully implement an agile strategy. However, this method can be adapted to more effectively center stakeholders' voices in program planning while still aligning with program requirements. A recent report titled Delivering on Justice40: Perspectives from State Agency Staff suggests that teams on DOE-funded building technology deployment programs could model open feedback and push for process-oriented change—intentionally breaking from the waterfall model. "State staff seem comfortable asking clarifying questions but don't often push for process changes (e.g., program design, milestones, resource deployment)—this requires not only those 'above' asking and providing options for feedback, but those 'below' sharing what they see or need. Try to break waterfall-style communications (information flowing down from federal to state to local actors) by purposefully asking for and giving feedback" [27].

Figure 2 Waterfall Communication vs. Agile Communication

Participatory Program Design

One key best practice for BTO-funded deployment teams is to consistently incorporate and prioritize the input of program beneficiaries in all aspects of program design, development, and implementation. This best practice supports multiple tenets of energy justice, including procedural, distributive, and recognition justice. Teams should integrate practices that allow for meaningful stakeholder input to inform the program throughout the program life cycle. Technology is usually designed for people, not usually designed by or with the people who use the technology. In some cases, it is most efficient not to include end-users in the design process, however this can lead to unintended consequences or even well-meaning technologies that don't get used, or cannot easily be repaired, due to lack of knowledge about the users or the context of the use [28].

There are three types of participatory design: "design for the user, design with the user and design by the user. In the first type, solutions are designed for a particular user need, and users are consulted throughout the process. In the second, designers and users work together throughout the entire design process to co-design a solution together. And in the third type, users are taught the basics of design and provided access to tools and resources necessary for the design process, as they frame their own challenges and design their own solutions" [28]. BTO deployment teams should consider multiple ways to include all three types of participatory design into their work. Stakeholders can inform many aspects of the program, including:

- What types of resources the team develops,
- What types of technical assistance should be offered,
- What languages resources are available in,
- What terminology is used to talk about the program,
- How best to provide recognition for successful installations,
- How to share information with stakeholders, and more.

"In the development and design fields, we must be mindful of a few truths that exist in tension: Everybody can be active creators of technology, not just passive recipients of it—yet not everyone has the desire to co-create or has equitable access to the resources necessary for generating and sustaining the development of that technology.

As leaders, innovators, and catalysts in these fields, we have the opportunity to determine when and how to give people access to the tools, time, and space necessary to create together—especially in places where individuals may have fewer opportunities or less access to those resources.

In this time of national and international crises caused or exacerbated by a lack of equity and equality, we can improve access to opportunity by our own decisions when designing development-focused innovations".

~Sher Vogel, *Co-Creating a More Equitable World*

Energy Justice and Equity in Team and Program Design Metrics

Improving the diversity, equity, inclusion, and access (DEIA) of program teams can significantly improve the team's ability to develop equitable solutions to technology deployment that are grounded in both established scholarship and lived experiences (see Table 2). Furthermore, DOE teams are tasked to support the cultivation of a federal workforce that "draws from the full diversity of the Nation and advances equitable employment opportunities" per Executive Order 14035 [29]. Achieving meaningful stakeholder participation in decision-making is most effectively realized through a diverse team of staff and "boots-on-the-ground" external advisors who accurately represent the target sector of the program. Ensuring that team members have a contextual understanding of EJE concerns and historic local conditions further enhances the team's ability to address and incorporate these critical considerations into the decision-making process. The following metrics and best practices can be used to track energy justice and equity or Justice40 progress, and also appear in the EJE-BEST deployment and reporting tool.

Table 2 Energy Justice and Equity in Team and Program Design Metrics

Internal Understanding of Equity	This best practice highlights the completion of educational opportunities, such as training sessions, by the team, specifically in areas related to bias, diversity, equity, inclusion, access, energy justice and equity, environmental justice, or cultural humility.
Presence and Involvement of Public Advocates	This metric is satisfied if the team collaborated with external advisors specializing in energy justice and equity or the target sector(s) to provide ongoing feedback and support.
Staff and Decision-Maker Representation	This best practice guides the program team in surveying and reporting the diversity of the team (e.g., Internal program team, external advisors, organizers, others who input programmatic decisions).
Adoption of Historical Narratives/Root Causes of Disparities in The Energy System	This best practice is satisfied if the team has worked to grow the collective understanding and knowledge of the historic conditions that exist in the building sector, financial institutions, and/or energy system. This knowledge can be obtained through opportunities such as training, professional development, or continuous learning opportunities.
Cosmopolitan Justice Training	This best practice indicates if the team has pursued training or self-directed education on energy life cycle thinking and the benefits and burdens of the energy system across its life cycle.

Identify Benefits, Goals, and Target Sectors

Identify Flow of Justice40 Benefits to Target Sectors

While teams can start their EJE journey anywhere, it is recommended to start by determining the flow of Justice40 benefits (J40 benefits) to target sectors. As noted in the Introduction, the Justice40 Initiative directs at least 40% of the overall benefits of certain federal investments flow to DACs [8]. J40 benefits manifest when funds or resources invested in a program, flow through the program components, and directly support the program's aligned J40 goals (e.g., programs using funding to provide technical assistance that supports the DOE BTO deployment program aligned J40 goal of accelerating the adoption of efficient building technologies within the target sectors or populations). As noted in the Introduction, the Justice40 Initiative directs at least 40% of the overall benefits of certain federal investments flow to DACs [8]. In order to determine the flow of J40 benefits through the program, teams must identify the following:

- **Aligned J40 goals/benefits,**
- Total program funding,
- List of program components,
- The **benefit flow type** through all program components (direct, indirect, none, unknown),
- % of funding allocated to each program component,
- **Target sectors**,
- % of target sector engagement in each program component.

Track [goals/benefits] [%flowing] to [target sectors]:

Aligned Program Goals/ Benefits

Teams should document the goals of the program and look for opportunities to align them with the Justice40 Initiative priorities by identifying which of the priorities can be supported through the program. Teams can also align their goals with other sponsor priorities. The aligned J40 program goal is synonymous with the J40 program benefit, since the program aims to achieve these goals within the target sectors or stakeholder groups, so that they can benefit from the technology deployment.

Flow of J40 Benefits

Determine which program components can directly result in progress towards the Aligned Program Goals. Identify the amount of resources spent on program components with a direct flow of benefits and track the percent of engagements with target sectors or DACs within these program components.

Target Sectors

A target sector is either a group of building types or a group of stakeholders at which the program aims its efforts and resources. For BTO programs, a target sector is a subset of the larger commercial or residential building sector [13].

Aligned Program Goals and Benefits

The first step in the process of determining the flow of benefits from programs to DACs or target building sectors is to **determine the program's aligned J40 goals**—program goals that are aligned with the priorities established in the Justice40 Initiative, and potentially other sponsor agency or DOE office level priorities. **The program goal is synonymous with the program benefit, since the program aims to achieve these goals within the target sectors or stakeholder groups, so that they can benefit from the technology deployment.** J40 benefits manifest when funds or resources invested in a program, flow through the program components, and directly support the program's aligned J40 goals.

As outlined in Figure 3, teams should start by listing the high-level goals of the program (e.g., accelerating the adoption of integrated lighting technologies in commercial buildings) and then align the goals with the Justice40 Initiative priorities by identifying which of the priorities can be supported through the program.

The White House Environmental Justice Advisory Council and the DOE Office of Energy Justice and Equity have set forth the following eight policy priorities to guide DOE's Implementation of Justice40 [5]:

- Decrease energy burden in DACs.
- Decrease environmental exposure and burdens for DACs.
- Increase parity in clean energy technology access and adoption in DACs.
- Increase access to low-cost capital in DACs.
- Increase clean energy enterprise creation and contracting in DACs.
- Increase clean energy jobs, job pipeline, and job training for individuals from DACs.
- Increase energy resilience in DACs.
- Increase energy democracy in DACs.

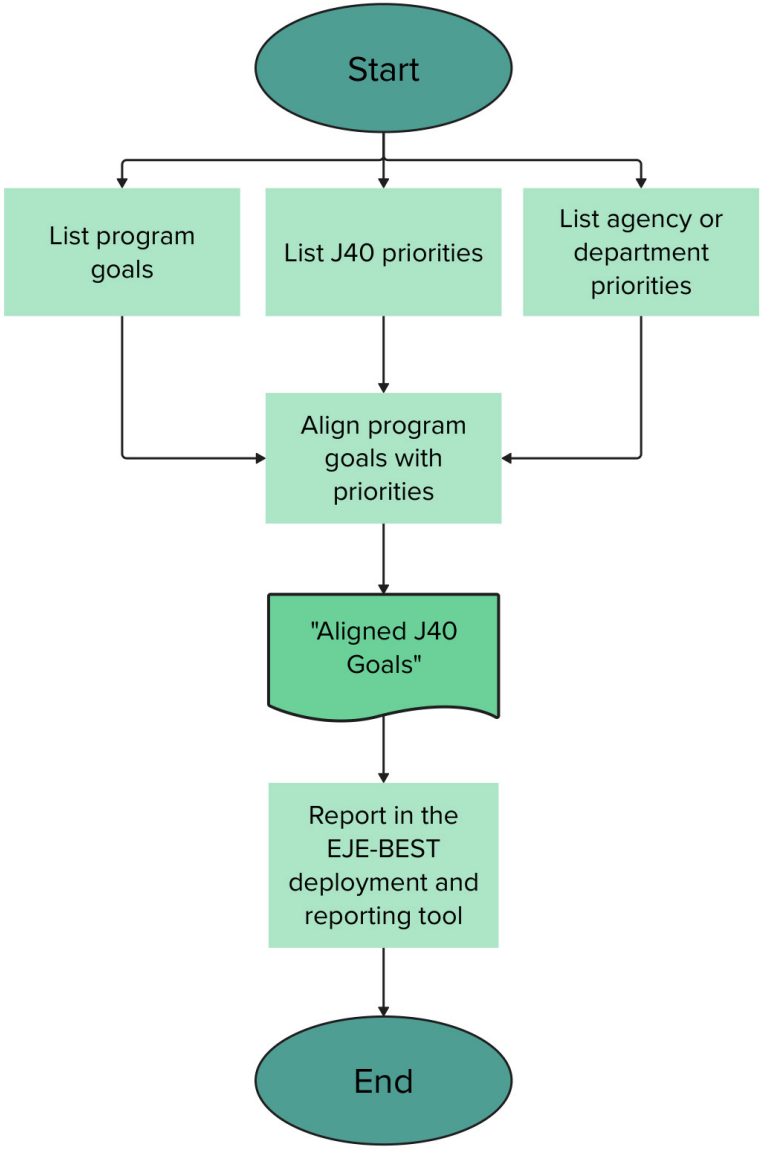


Figure 3 Workflow Diagram for Determining Aligned J40 Goals

In addition, the team can determine the high-level priorities of the program sponsor (e.g., BTO or DOE) and identify which of those priorities can be supported through the program. In the case of the Integrated Lighting Campaign case study, the PNNL team aligned the stated priorities of DOE, BTO, and Commercial Buildings Integration (CBI) with the J40 priorities, and then aligned the program goals with the J40 and sponsor priorities that can be addressed through the program.

The **aligned J40 goal** of the Integrated Lighting Campaign is to accelerate the adoption and integration of novel lighting technologies, such as sensors and controls, in target sectors. This adoption would directly benefit the targeted stakeholders or sectors by enhancing the utilization of energy-efficient building technologies.

Although DOE programs offer many benefits, it is most important to identify and track the J40 benefits that occur when the money or resources invested in a program flow through the program components, and directly support the program's aligned J40 goals. Teams should document the goals of the program and look for opportunities where integration of EJE elements will support the program goals as well as DOE policy priorities.

Flow of J40 Benefits through Program Components

Program components are elements, or sub-tasks, of a program that have unique outcomes. As an example, BTO technology campaigns typically include the following program components:

- knowledge development and sharing,
- technical assistance,
- a recognition program,
- stakeholder engagement,
- team travel, and
- project management.

Knowledge development entails creating, compiling, and sharing resources, tools, and technical materials

Technical assistance or energy advising efforts are service-based, collaborative, and adaptable meetings (e.g., focus groups, targeted workshops, or webinars) tailored to directly assist or advise and reduce barriers for technology adoption [30].

Efforts such as developing recognition website pages, resources, materials, recognition categories, as well as reviewing application submissions and granting awards fall under the **recognition program**.

Stakeholder engagement efforts entails building relationships and opportunities for collaboration and partnership with target sectors. This can vary based on audience and goals, but can include workshops, advisory groups, events, or meetings. Presentations to research peers at conferences would not be included in stakeholder engagement, however presentations at events where stakeholders are present

may count as stakeholder engagement. For a program component to have a direct flow of benefits, the work on that program component must directly support the aligned J40 goals. **Teams need to ask the question, "Do money or resources spent on this [Program Component] result in direct/ indirect/ unknown/ no outcomes on the [Aligned J40 Program Goals]?".** Program components with a direct flow of benefits can be used to track the flow of benefits to target sectors.

In the case of BTO technology campaigns, most of the J40 benefits flow through the stakeholder engagement, knowledge development, and technical assistance program components (see Table 3). Time or resources spent on these program components can directly accelerate the adoption of efficient building technologies for target sectors.

Counterintuitively, recognition efforts do not have a direct flow of J40 benefits to target sectors or stakeholders. While the recognition component may have distributive justice considerations regarding which installations are awarded, it does not directly support the aligned J40 goal of accelerating the adoption of efficient building technologies within the target sectors or populations because the recognition program awards success stories of previously completed work. The recognition program itself will not accelerate the adoption of efficient building technologies for target sectors, however, the recognition component may contribute to knowledge development by generating case studies or success stories that inspire others to adopt these technologies.

To approximate the magnitude of J40 benefits flowing through a program to target sectors, teams need to identify the percent of the total program funding allotted to each program component and each program component's benefit flow type (see Figure 4). There is a space to input this information in the EJE-BEST tool.

When making calculations about percent of total program funding allotted to each program component, consider these tips:

- Within the EJE-BEST tool, administrative and program management funds can be rolled up into the associated component categories.
- For the sake of J40 benefits accounting, it may be helpful for program managers to organize their work breakdown structure by the main program components.

Table 3 Benefit Flow Type Examples for BTO Technology Campaign Program Components

	Direct	Indirect	None
Knowledge Development	✓		
Technical Assistance or Energy Advising	✓		
Recognition Program		✓	
Stakeholder Engagement	✓		
Administration, travel, other programmatic elements			✓

More information on the metrics and best practices used to track and measure J40 benefits related to **knowledge development** and **technical assistance or energy advising** are shown at the end of this section in Table 6 and Table 7. More information on the metrics and best practices used to track and measure J40 benefits related to **stakeholder engagement** are shown in the 'Stakeholder Engagement' section in Table 8 and Table 9.

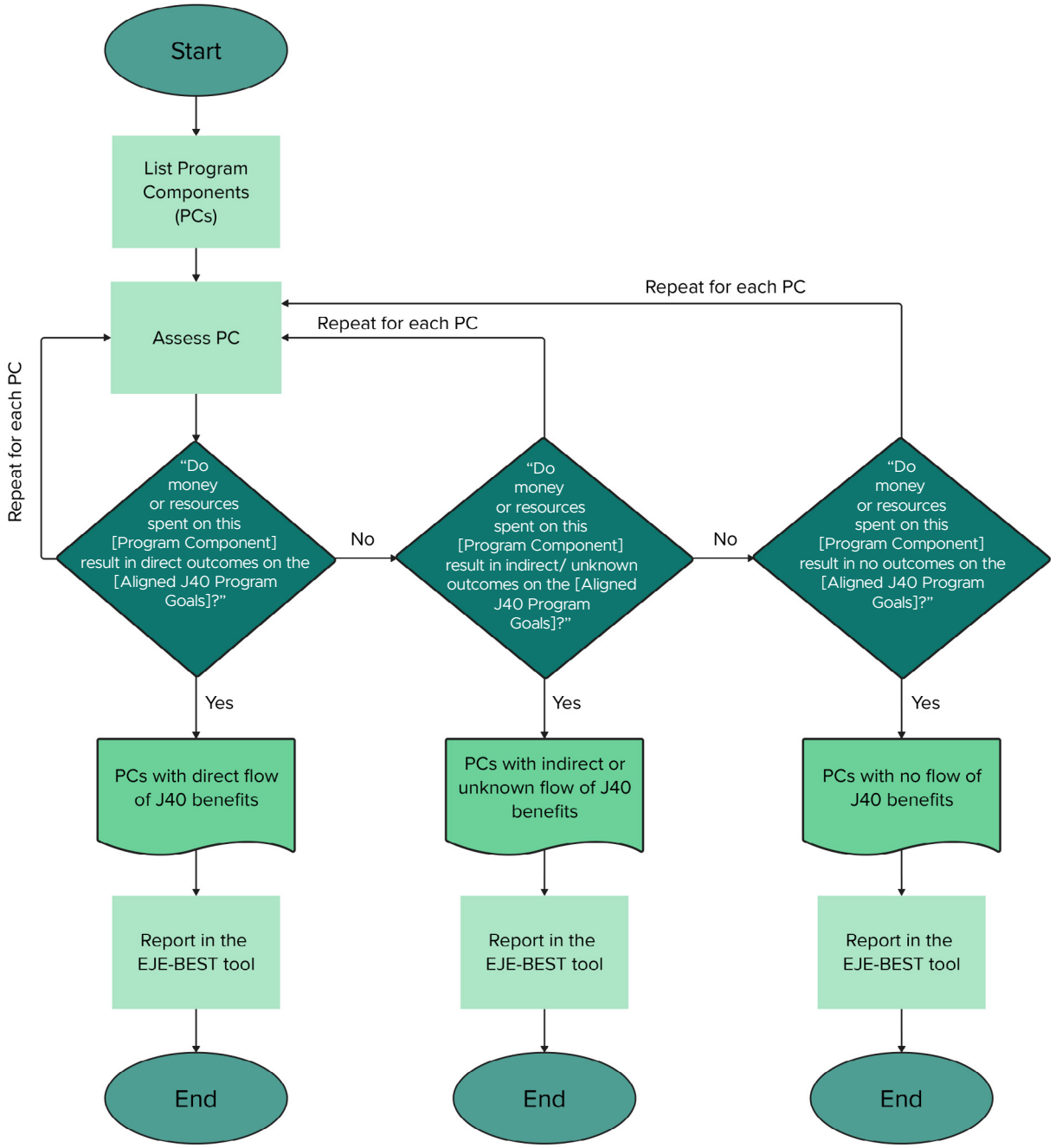


Figure 4 Workflow Diagram for Determining Benefit Flow Type Through Program Components

"Do money or resources spent on this [Program Component] result in direct/ indirect/ unknown/ no outcomes on the [Aligned J40 Program Goals]?".

Direct Flow of Benefits: Work on the program component directly supports the aligned J40 goals. The answer to the question: "Does money or resources spent on this [Program Component] result in direct outcomes on the [Aligned J40 Program Goals]?" is "Yes".

Indirect Flow of Benefits: Work on the program component may indirectly support the aligned J40 goals or the impacts of the work on the aligned J40 goals are unknown. The answer to the question: "Does money or resources spent on this [Program Component] result in indirect or unknown outcomes on the [Aligned J40 Program Goals]?" is "Yes".

Target Sectors or Populations

A critical step towards integrating EJE into building technology deployment programs is identifying the target sector(s) at which the program aims to flow J40 benefits. A just energy system distributes benefits equitably, and remediates burdens (social, economic, health related) on those who are disproportionately harmed by the energy system, while giving them an opportunity to influence research design, development, and deployment processes [13]. In order to distribute benefits equitably and remediate burdens on those who are disproportionately harmed by the energy system while offering meaningful opportunities to participate in decision-making, programs must clearly define the target sectors or populations they aim to affect. Target sectors for the program can be input in the EJE-BEST deployment and reporting tool.

While M-23-09 states that "Federal agencies should now start using the White House Climate and Economic Justice Screening Tool (CEJST)[7] to identify geographically defined disadvantaged communities for any covered programs under the Justice40 Initiative and for programs where a statute directs resources to disadvantaged communities, to the maximum extent possible and permitted by law", M-21-28 indicates that "**It may not be possible to accurately measure the allocation of covered program benefits based solely on the geography where the program expenditures occur.** Accordingly, agencies should actively consider the purpose of the covered program when determining whether covered program benefits have accrued to disadvantaged communities. For example, an energy efficiency program that provides weatherization assistance to individual households may need to analyze the allocation of program benefits by tracking the characteristics of recipient households, rather than relying on geographic indicators" [3] [4].

Many indexes currently used to identify burden are residentially focused, leaving out commercial, industrial, and even multi-family buildings. Energy burden, the percentage of gross household income spent on energy costs, has been widely researched and applied to residential buildings, but there is little understanding of how to apply this metric to commercial buildings [31]. **Research on energy burden and energy insecurity in commercial buildings is inadequate, due in part to a lack of commercially focused metrics or indexes (energy burden and energy insecurity are only defined for households). More work is needed to develop robust metrics and mapping of UIBs so that programs under BTO CBI can more effectively support their target sectors, and more effectively track the benefits of these commercially focused programs.**

For programs under BTO, target sectors may be a subset of commercial or residential buildings. **A building's geographic location within a CEJST-defined DAC is not a clear indicator that program benefits will flow to DACs.** In other words, a commercial building receiving a clean energy installation located near or within a DAC does not automatically mean that the benefits of the installation would help the adjacent community. Some predatory businesses may even target DACs (e.g., payday loan businesses). However, there are building types that are known to be underinvested and building types that reach into the community, such as institutions like schools or libraries [1] [32] [33]. Building types that positively affect the surrounding community are called *community asset buildings* or installations. Through literature reviews and conversations with external advisors, the PNNL team identified a set of target building sectors that may directly benefit the communities in which they reside (see Table 4).

[7] See the section Tracking J40 Benefits to DACs through Buildings for more information on the CEJST.

Table 4 List of Proposed Target Sectors for BTO Deployment Programs

Target Sector	Target Population Definition
Type: Small Building or Installation	Building or installation under X ft^2 (area to be determined by the program)
Type: Community Asset	A building or installation that improves the quality of community life.
Type: Underinvested Building	Definition and criteria to be determined by the program in lieu of a DOE definition.
Location: Federally Recognized Tribal Lands	A building or installation located on Federally Recognized Tribal land.
Location: Non-Federally Recognized Tribal Lands	A building or installation located on non-Federally Recognized Tribal land (e.g., state recognized tribes, other American Indians, or Alaskan Natives).

While the proposed target sectors for building technology deployment programs focus on building types and geographically situated DACs, not all BTO spending goes towards projects in fixed locations or building types. Teams may also rely on other designations that represent Justice40 priority populations. There are spaces to input other target sectors or populations in the EJE-BEST tool. Other designations may include:

- Institutions/education: minority-serving institutions (MSI), historically black colleges and universities (HBCUs), students from Title I schools, etc.,
- Businesses: small businesses, disadvantaged businesses, minority-owned businesses, etc.,
- Workforce: non-English speakers, immigrant population, women, etc.,
- First-time applicants, new entrants into the BTO funding ecosystem.

Small Buildings

Small buildings, specifically those less than 25,000 ft^2, are recognized as a target sector by BTO programs. This emphasis is due to the inherent challenges of implementing energy efficiency measures in small buildings. Energy efficiency deployment challenges are even more pronounced for small buildings located in disadvantaged and rural communities, partially due to historical disinvestment and legacies of policies [34]. Furthermore, as discussed by Clarke et al., buildings in underserved areas are likely to be older and less energy efficient, resulting in higher heating and cooling bills than newer, more efficient buildings [34].

There is more work to be done to understand and quantify energy inequities in the small commercial building sector, as very little research has been conducted in this area. Although some studies have explored energy inequities in small businesses, it is important to acknowledge that small businesses are not always located in small buildings, and vice versa [6] [34] [35] [36] [37]. To achieve equitable and just decarbonization and energy efficiency in U.S. buildings, small buildings must be a focus.

Similarly, the current understanding of energy burden and energy insecurity in commercial buildings remains limited, particularly when it comes to small building and businesses owned by minorities. Some barriers to energy efficiency measures in small commercial buildings may include the lack of a building automation system and absence of a dedicated facility manager as the knowledge holder and implementer of upgrades and new installations. Clarke et al. lists other barriers to decreasing energy burdens in small buildings including, racial disparities in access to capital, favoritism of large commercial businesses over small businesses, split incentives, high transaction costs relative to energy cost savings, and lack of sector specific resources and technologies [34].

Community Asset Buildings, Businesses, or Installations

BTO Commercial Building Integration (CBI) deployment programs traditionally target commercial industry sectors like healthcare, retail, or hospitality, rather than communities. To direct the benefits of deployment programs to communities, it is important to understand the relationship that certain building types have with the communities in which they operate. Two questions guided the investigation of the connection between geographic location and flow of J40 benefits to DACs:

- When do improvements to commercial buildings result in tangible benefits to the community?
- How can the flow of benefits be tracked?

What Are Community Asset Buildings?

A community asset or resource is anything that improves the quality of life in a community. Community assets are grouped into seven different categories: natural, cultural, human, social, political, financial, and built [38] [39]. Strong and resilient communities show balance in these seven areas [40].

Built assets are the physical structures and facilities needed by a community. Community asset buildings fall into two categories:

Primary Community Asset Buildings: Community assets that are largely under community control. Examples include:

- Individual local businesses
- Citizens associations
- Cultural organizations
- Religious organizations

Secondary Community Asset Buildings: Community assets where users of the asset do not also control the asset. Examples include:

- Public schools
- Social service agencies
- Hospitals
- Libraries [41]

Technology deployment programs can enhance community well-being by focusing on community asset buildings and installations that contribute to the overall quality of community life.

Buildings and Community Resilience

Resilient buildings are included within the community asset definitions. In addition to being one of DOE's policy priorities for the implementation of J40, resilience is featured as one of the overarching priorities for DOE's 2050 planning goals. The upcoming DOE blueprint for decarbonizing U.S. buildings by 2050 lays out a national strategy for reducing building greenhouse gas emissions while prioritizing equity, affordability, and resilience benefits to communities [42].

Resilience hubs are one way that community resilience can be strengthened. According to the DOE, community resilience is defined by "a community's ability to use available resources to respond to, withstand, and recover from adverse situations. Strengthening community resilience not only helps people, businesses, and cities maintain essential functions and bounce back from adversity but also move towards enhanced wellbeing" [43]. Community resilience hubs are locally identified and community-serving facilities that provide residents year-round support to resources [44] .

Underinvested Buildings

As noted previously, "it may not be possible to accurately measure the allocation of covered program benefits based solely on the geography where the program expenditures occur" [3] [4]. For programs focused on commercial buildings, this point is especially applicable. A building's geographic location within a Justice40 Initiative-defined DAC is not a clear indicator that program benefits will flow to DACs. In other words, a commercial building receiving a clean energy installation located near or within a DAC does not automatically mean that the benefits of the installation would help the surrounding community.

There is currently no clear methodology for defining UIBs, so this guidance document leaves it up to each program to determine criteria.

Energy Insecurity tracks the impacts stemming from the inability to pay one's energy bills, or the inability to adequately meet basic household energy needs [45]. "Energy insecurity is not well documented for commercial buildings, yet it is a vital lens to address the barriers business or property owners face due to energy-related costs. A business or property owner may suffer from energy insecurity if they are unable to afford regular maintenance and repairs on heating, ventilating, and air-conditioning (HVAC) systems and water heating systems, or if they are unable to replace a failed system. The inability to replace a failed HVAC system can be doubly problematic if the business must shut down or reduce services and lose income" [34].

A focus on UIBs may include a focus on geographically rural buildings. It is known that rural residential buildings have higher energy burdens than urban residential buildings. "Nationally, the median rural household energy burden is 42% higher than the median urban energy burden. Rural households, which comprise 16% of U.S. households across 72% of the country's land area, have a median energy burden of 4.4%, compared to the national median energy burden of 3.3%" [34].

Buildings on Federally and non-Federally Recognized Tribal Lands

The U.S. Office of Management and Budget's Interim Implementation Guidance "defines a community as either: (1) Geographic: a group of individuals living in geographic proximity (such as census tract), or (2) Common condition: a geographically dispersed set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions" [2]. The Interim Implementation Guidance also indicates geographic areas within Tribal jurisdictions should be included in the definition of disadvantaged communities [4].

Buildings that are located on Federally Recognized Tribal lands are included in the proposed set of BTO target sectors (see Table 4), as well as buildings that are located on non-Federally Recognized Tribal land (e.g., state recognized tribal lands) [46]. Program teams can identify if the building or installation that they are supporting is located on Federally Recognized or non-Federally Recognized Tribal land or a U.S. territory during the stakeholder engagement process or by using CEJST. The CEJST geospatial mapping tool displays lands within the boundaries of Federally Recognized Tribes as DACs. Because the boundaries of census tracts and the lands of Federally Recognized Tribes are different, the land within the boundaries of Federally Recognized tribes are highlighted as disadvantaged census tracts on CEJST [43]. Furthermore, even if a Federally Recognized Tribe has no land, all Federally Recognized Tribal entities are considered disadvantaged communities for the purposes of the Justice40 Initiative [2].

Best Practices Related to Setting Energy Justice and Equity Goals

Setting goals related to Energy Justice and Equity (EJE) promotes the attainment of more equitable program outcomes (see Table 5). It will be difficult to make progress on EJE goals without identifying the specific populations and target sectors the program aims to benefit, as well as determining what Justice40 (J40) benefits the program can provide. Actively involving stakeholders in establishing program goals and benefits assures that the program's goals and benefits align with stakeholder needs. The following best practices can be used to track progress towards energy justice and equity or Justice40 goals. These practices are also featured in the EJE-BEST tool.

Table 5 Goal Setting Best Practices

Define Equity Goals	This best practice is satisfied if the program has established aligned J40 and other energy justice and equity goals.
Propose Program J40 Benefits to DACs or Target Sectors	This best practice is satisfied if the program team has proposed potential program J40 benefits to disadvantaged communities (DACs) or target sectors.
Consult on Proposed Program J40 Benefits with DACs or Target Sectors	This best practice, which is a directive of J40, indicates whether the program team has consulted with community stakeholders to iterate, improve, or update the program J40 benefits to DACs or target sectors.
Publicly Available Energy Justice and Equity Goals	This best practice tracks whether the program's specific energy justice and equity goals are shared outwardly for accountability and public feedback.
Define Target Populations and Sectors to Support Energy Justice and Equity	This best practice tracks whether the program sectors should be targeted to maximize the flow of J40 benefits to target populations and sectors.

Measuring the Flow of J40 Benefits in Deployment Programs

J40 and Energy Justice and Equity Metrics, Approaches, and Tools

Once the aligned program goals, the flow of J40 benefits through program components, and the target sectors have been identified, teams can input these program characteristics into the EJE-BEST deployment and reporting tool. The next step is to measure the flow of J40 benefits to target sectors. This section outlines J40 and energy justice and equity metrics, approaches, and tools that can be used to measure the flow of J40 benefits from deployment programs to DACs and target sectors. The energy justice and equity Justice40 calculation methodology is outlined in Appendix A.

To determine the extent of J40 benefits flowing to DACs and target sectors, methodologies will need to continue to be developed and implemented. Measurement methodologies should be applied to data from current and past building technology deployment programs (to the extent that is possible). This ongoing measurement of progress is crucial for identifying gaps and pinpointing opportunities for improvement.

While the flow of J40 benefits from each program may vary, BTO will sum up the J40 benefits from each program and report at the agency level. Even though programs will have variations in the percent flow of J40 benefits to target sectors, it is important that all programs strive to maximize benefits to communities.

According to the *M-21-28 Interim Implementation Guidance for the Justice40 Initiative*, the 40% benchmark should be met and reported at the agency level. "Agency heads are responsible for calculating the accrual of covered program benefits to disadvantaged communities" [4]. Each agency is directed to deliver:

- an assessment of covered agency programs (see IIA and IIB of M-21-28),
- a description of the types of benefits that result from the identified covered programs,
- a methodology for calculating the covered program benefits accruing to disadvantaged communities or target sectors,
- a description of the metrics that the agency is developing to measure covered program benefits, and
- a measure of the J40 benefits flowing to DACs and target sectors in each program [4].

This section gives an overview of approaches and tools that can be used to identify DACs, as well as target building sectors. These tools will support the team's ability to measure and report the flow of J40 benefits to DACs or target sector buildings.

Tracking J40 Benefits to DACs through Buildings

"Federal agencies will use the [the White House Climate and Economic Justice Screening Tool (CEJST)] tool for the Justice40 Initiative. It will help them identify disadvantaged communities that should receive 40% of the overall benefits of programs included in the Justice40 Initiative" [47]. While this tool is useful for programs that are focused on communities or residential buildings, it can present a challenge for programs that are focused on commercial buildings, such as the Commercial Buildings Integration subprogram of DOE BTO.

Many of the indexes used in EJE mapping tools such as CEJST and EJScreen are residentially based and do not have a commercial equivalent. Specifically, indexes such as energy burden, energy insecurity, energy poverty, and energy vulnerability are based on households [31] [48] [49] [50]. Therefore, more evaluation is necessary to determine how to apply these indices to commercial buildings.

Tracking and reporting the flow and magnitude of J40 benefits realized by target sectors and populations is dependent on data availability. There is limited data available to directly quantify most J40 benefits, especially related to technology deployment in commercial buildings. The team may have access to the census tract data for the building, business, or installation, but may not have access to other demographic or socioeconomic data about the business owner, facility manager, or other individuals (e.g., their home address or census tract, their preferred gender, racial or ethnic identity, or home energy burdens). **BTO deployment teams must expand their tracking approach by utilizing J40 indicators and proxies, in addition to the data that is available for direct measurements.**

Tools for Identifying Disadvantaged Communities

This section provides a brief overview of the interactive geospatial tools supported by the DOE for implementation of Justice40 in DOE-funded projects. The White House Council on Environmental Quality (CEQ) created the **Climate and Economic Justice Screening Tool (CEJST)**[8], which relies on indicators of burdens in eight categories: climate change, energy, health, housing, legacy pollution, transportation, water and wastewater, and workforce development, to identify DACs [51] [52]. In order for a census tract to be categorized as disadvantaged, it must meet a threshold for at least one of the eight burden categories, as well as an associated socio-economic burden such as low-income or high school education attainment. As per guidance from the White House Office of Management and Budget (OMB), federal agencies can use additional indicators specific to their agency missions to further prioritize disadvantaged census tracts within their work. To this end, DOE-funded programs can use the **Energy Justice Mapping Tool**[9] to better understand energy-specific burdens within DACs. The Energy Justice Mapping Tool refines understanding of DACs using 36 indicators that indicate energy burden, fossil dependence, vulnerable populations, and environmental/climate hazards across all census tracts.

Environmental Justice Screen or **EJScreen**[10] is a similar tool with overlapping datasets; however, it serves different purposes, and its use has not been recommended for DOE-funded projects. EJScreen is an environmental justice mapping and screening tool developed by the Environmental Protection Agency (EPA) that provides nationally consistent datasets and approaches for combining environmental and demographic socioeconomic indicators. EJScreen relies on a variety of environmental and socioeconomic indicators, as well as environmental justice indexes and supplemental indexes [53].

[8] https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5

[9] https://energyjustice.egs.anl.gov/

[10] https://www.epa.gov/ejscreen

These three tools serve different purposes, but the datasets overlap, and they can all be used to gain a better understanding of EJE concerns in specific geographic areas. For more information on the CEJST tool see Appendix B.

Census Tract Best Practices

Tracking the flow of benefits to DACs requires identification of geographic locations. Although the *M-21-28 Interim Implementation Guidance of the Justice40 Initiative* seeks census block data, the CEJST utilizes census tract data in its methodology [4] [47] [51]. In order to align with the CEJST, the EJE-BEST tool collects census tract information, in addition to prompting teams to provide full street address information, when available. If the team is providing energy advising or engaging with stakeholders focused on a specific building or installation, it is best to capture the full street address(es) or census tract(s). Collecting full addresses for buildings or installations enables future identification of census tracts and/or blocks.

Collecting census tract information or full addresses for all stakeholders may not always be feasible or beneficial. For example, teams may engage with community-based organizations that distribute resources or make connections with their own downstream networks. In cases like this, it may be more useful to collect the state or region of the contact.

How to find a census tract or block:

Geographic information, such as the state, county, tract number, block number, and block group number, can be identified for a particular address using CEJST or the Census Geocoder.

Image Credit: Design Trust for Public Space
'Opening the Edge' Community Design Meeting

Metrics and Best Practices to Support Energy Justice and Equity in Knowledge Development

Building technology deployment programs seek to accelerate the adoption of energy-efficient building technologies or approaches by creating a knowledge base of implementation guidance and case studies for featured technologies. To this end, knowledge development should be tailored to reflect and respond to the needs of target populations and sectors. Recognizing that financial barriers pose a significant obstacle to technology adoption in disadvantaged communities and underinvested buildings (UIBs), it is essential for program teams to actively create resources aimed at mitigating these financial challenges [54]. The following metrics (see Table 6) and best practices can be used to track progress towards energy justice and equity or Justice40 goals. These metrics and best practices are also featured in the EJE-BEST tool.

Table 6 Knowledge Development Metrics and Best Practices

Accessible Language	This best practice indicates whether the team has reviewed and updated the website and other resources for inclusive and plain language.
Multiple Languages	This best practice tracks whether program resources are available in languages other than English and, if so, in which languages the resources are available.
Resources for Reducing Financial Barriers	This best practice highlights efforts made by the team to develop resources that detail funding and financing options available to support the adoption of the featured technology (e.g., resources on rebates, alternative financing).
Targeted Knowledge Development	This metric tracks the number of resources developed based on interactions with target sector stakeholders, and the percentage of new resources or case studies developed that are focused on supporting disadvantaged communities or target sectors.
Multichannel Resource Availability	This best practice highlights whether the team provides resources for target sectors using a variety of offline and online communication channels (e.g., local newspapers, industry publications, radio stations, social media platforms, or community-specific forums).

Metrics and Best Practices to Support Energy Justice and Equity in Technical Assistance or Energy Advising

A key method used by building technology deployment programs to accelerate the adoption of energy-efficient building technologies involves providing technical assistance or energy advising. To be effective, technical assistance must be service-based, collaborative, tailored to the audience, and adaptable [30]. Deployment program teams should direct technical assistance efforts toward target sectors that require support. Offering technical assistance or energy advising in multiple languages expands opportunities to help stakeholders (see Table 7). The following metrics and best practices can be used to track progress towards energy justice and equity or Justice40 goals. These metrics and best practices are also featured in the EJE-BEST tool.

Table 7 Technical Assistance or Energy Advising Metrics and Best Practices

Multiple Languages	This best practice identifies whether technical assistance (TA) or energy advising is available in multiple languages and, if so, which languages are available for TA or energy advising.
Agile Communication within Technical Assistance or Energy Advising	This best practice identifies changes, updates, or additions to the technical assistance (TA) or energy advising offered based on stakeholder feedback.
Direct Assistance to Target Sectors	This metric tracks what percentage of technical assistance or energy advising was directed toward the target sectors identified by the program team.

Stakeholder Engagement

Creating and Implementing a Stakeholder Engagement Strategy

As detailed in the M-21-28 guidance memo, "All Justice40 covered programs are required to engage in stakeholder consultation and ensure that community stakeholders are meaningfully involved in determining program benefits" [4]. Owners, managers, and tenants of UIBs face difficulties accessing the health, social, and financial benefits of energy-efficient building technologies [33] [32] [54]. BTO deployment programs, can mitigate these barriers and promote the equitable deployment and adoption of building technologies in UIBs. However, this requires consensus and collaboration from all relevant stakeholders. EJE stakeholder engagement strategies and best practices can be implemented at any stage of a program. Whether the program is just getting started or in its last year, it is never too late to engage stakeholders and solicit their involvement and feedback.

To strengthen cooperation among stakeholders, teams should develop an engagement and outreach strategy that directly centers the people who work with, or benefit from, the outcomes of the program [55]. Stakeholder engagement promotes the idea that stakeholders bring unique perspectives to addressing social, cultural, environmental, and economic concerns, therefore they should be directly involved in collaboration, innovation, and program design [56]. This will allow deployment program teams to take actions and deploy resources that adequately address barriers to access and participation, foster community buy-in for longer-term behavior change, and ultimately bring benefits to stakeholders [57]. Creating a stakeholder engagement strategy includes:

- Identifying target stakeholders,
- Analyzing stakeholders,
- Mapping stakeholders,
- Drafting a stakeholder engagement plan,
- Creating a stakeholder management system.

The following sections describe each step of this process in detail. A compilation of best practices is provided toward the end of this section to enable teams to apply the lessons learned here in ways that are equitable, accessible, and inclusive.

Image Credit: GDS-team
Cross-government service design meetup
Economics and social change

Identifying Target Stakeholders

Before developing a stakeholder engagement strategy, teams must first identify the stakeholders they wish to build a relationship with. **A stakeholder is either an individual, group, or organization that's impacted by the outcome of a project or a program. For building technology deployment programs, stakeholders include individuals, groups, or organizations who have an interest in the success of the program or who can benefit from the program.** Stakeholder theory was first proposed in 1984 by R.E. Freeman, who defined a stakeholder as "any group or individual who can affect or is affected by the achievement of an organization's purpose" [58]. In the context of deployment programs, a stakeholder is any person, group, or organization who contributes to, has a vested interest in, or benefits from the adoption of clean energy technology in buildings. These include, but are not limited to, building owners, managers, tenants, utilities, financial institutions, manufacturers, energy efficiency organizations, community or advocacy groups, energy service companies, end-users, or residents. When identifying stakeholders, work to prevent overlooking communities due to internal biases or lack of exposure. Programs may find it useful to distinguish between stakeholder and community engagement [59]:

- **Community Engagement:** Activities designed to reach specified communities such as those that may be impacted by building upgrades and, to the extent applicable, communities that have been historically marginalized from decision-making or have experienced disproportionately high burdens and low benefits from previous policies and programs.
- **Stakeholder Engagement:** Activities focusing on engaging with people or organizations that have historically been recognized as having a direct stake in an initiative and its effects, and stakeholders from other sectors that could be strong contributors to the initiative (e.g., heath or housing organizations, business improvement districts, neighborhood organizations).

Analyzing Stakeholder Motivations, Interests, Needs, and Challenges

Together team members and partners should **analyze stakeholders to better understand their motivations, interests, needs, and the challenges they face in regard to adopting or using the technology of interest.** PNNL created a series of sample Stakeholder Profiles that provide an overview of individuals, organizations, or groups that have a vested interest or influence in the planning, implementation, and outcomes of clean energy initiatives. Each profile provides recommendations for engagement approaches, key messages, information products, and more. The complete set of profiles is included in Appendix C. These profiles were developed following a preliminary analysis of commercial building stakeholders and were subsequently reviewed and validated by external advisors and industry experts. They can be used to better understand how to engage target stakeholders to achieve the desired outcomes of the program and adapt as needed per stakeholder feedback.

While stakeholder interests can be generalized to a certain extent, there will always be variation between groups and individuals, thus it is important to connect directly with stakeholders affected by the program. Teams can create their own stakeholder profiles, and then use stakeholder engagement approaches to confirm or iterate on their assumptions. Stakeholder profiles are living documents and should continuously be updated throughout the course of the program.

Stakeholder Mapping

Once relevant stakeholders have been identified, teams can categorize each of the stakeholders through stakeholder mapping to better understand their level of influence and participation in the deployment program and their interest in the building technology. Stakeholder mapping is a valuable technique to visually represent and analyze the relationships between an organization and its stakeholders. Although several tools and frameworks exist for stakeholder mapping [60] [61], this guidance document will focus on the Power-Interest Matrix and the Stakeholder Engagement Assessment Matrix.

Power-Interest Matrix

A Power-Interest Matrix is an exercise that allows teams to classify target stakeholders to their level of influence or decision-making power and their interest in the technology or program (see Figure 5) [62]. Some stakeholders have the power either to block or advance the program. Some may be very interested in the program; others may not be interested at all. Stakeholders are plotted on a two-dimensional grid, with power on one axis and interest on the other. Stakeholders with high power need to be kept satisfied, while stakeholders with high interest need to be kept informed. When a stakeholder has both, make sure to manage their expectations very closely and communicate with them regularly.

From an EJE standpoint, stakeholder mapping can reveal which stakeholders are not adequately represented in the deployment program. This information can help teams to adapt their engagement strategies to better engage stakeholders from underrepresented groups.

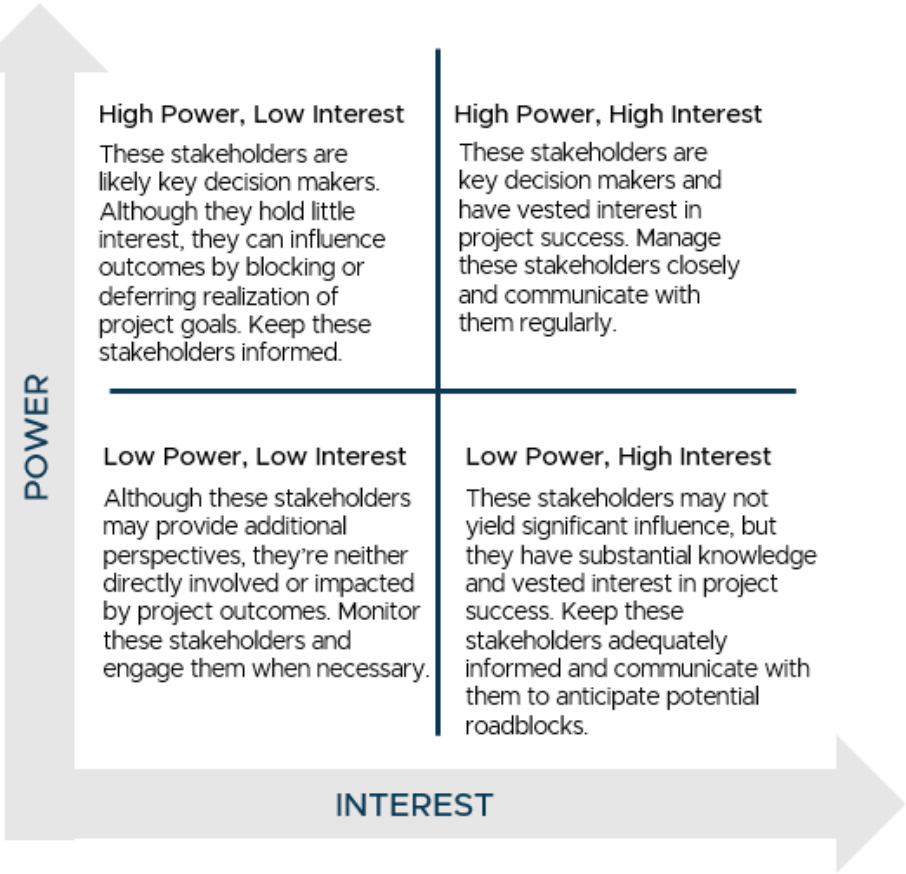


Figure 5 Power-Interest Matrix Categorization Strategy

Stakeholder Engagement Assessment Matrix

A **Stakeholder Engagement Assessment Matrix** is a tool traditionally used by project or program managers to record and monitor stakeholder involvement throughout the program life cycle (see Figure 6) [63]. Using this tool, program managers place stakeholders at their current level of involvement and track changes as the program progresses or new engagement strategies are used.

Based on the level of engagement, teams can categorize stakeholders into five groups:

- **Unaware:** Stakeholders are unaware of and uninformed about the program.
- **Resistant:** Stakeholders are not interested or unwilling to participate.
- **Neutral:** Stakeholders assume a neutral role but are aware of the program. They neither support, reject, nor engage in program activities.
- **Supportive:** Stakeholders are responsive and receptive to program activities, proposals, and communications.
- **Leading:** Stakeholders actively participate in program activities.

The "C" represents the current level of engagement of the stakeholder and the "D" represents the desired level of engagement [64].

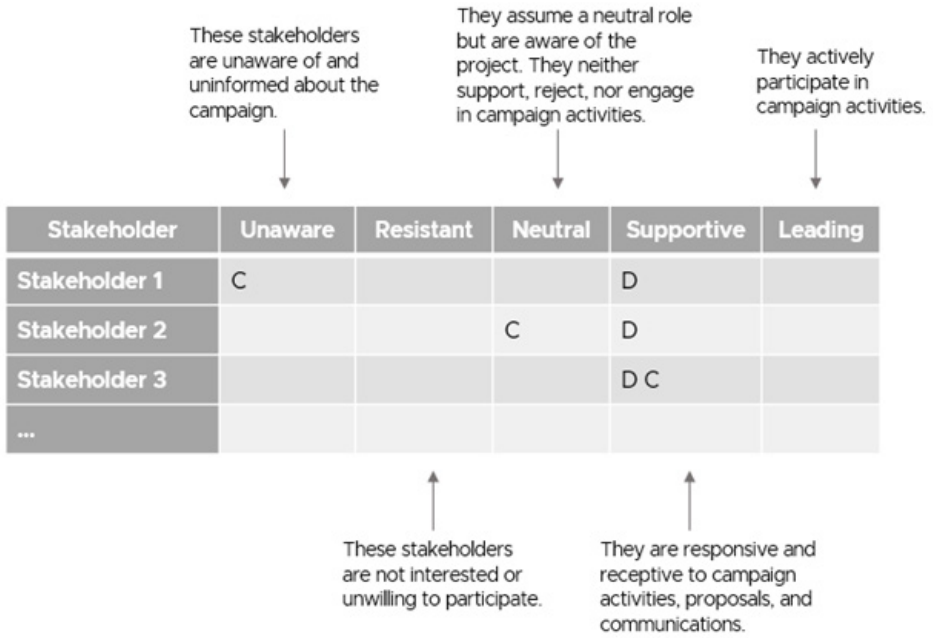


Figure 6 Stakeholder Engagement Assessment Matrix

The Power-Interest Matrix is well suited for mapping involvement of stakeholder groups in clean energy deployment projects, whereas the Stakeholder Engagement Assessment Matrix can be used to assess engagement of program partners, participants, and collaborators in the overall deployment program.

Creating a Stakeholder Engagement Plan

With a better understanding of each stakeholder group, teams can create a Stakeholder Engagement Plan. Stakeholder engagement planning [65] refers to organizing the outreach and communication activities most likely to contribute to program goals and improve outcomes for stakeholders or target sectors. Outreach and engagement methods should be tailored to the needs and communication preferences of each individual stakeholder, keeping in mind that preferences can be influenced by cultural norms, personal values, demographics, and existing community infrastructure. For example, some stakeholders may respond well to direct email outreach, while others prefer communicating via social media or online forums.

A stakeholder engagement plan should also include appropriate mechanisms for gathering feedback and tracking progress toward goals [66]. Although the content can be adapted to fit the specific program, it is beneficial to include the following sections:

- Introduction and Objective
- Team Roles and Responsibilities
- Mission and Vision
- Goals and Key Performance Indicators
- Stakeholder Analysis
- Stakeholder Mapping
- Activities and Timelines
- Feedback and Evaluation

The program's stakeholder engagement plan will inform resource planning, timeline, milestones, budget, and deliverables at the onset of the deployment program. However, it is a working document and should be continuously referenced and adapted to stakeholder feedback.

Creating a Stakeholder Management System

Evaluating effectiveness of stakeholder engagement efforts requires a systematic approach to monitoring relationships, documenting outreach activities, tracking progress, and reporting on outcomes. A greater focus on community engagement across DOE and BTO programs underscores the importance of a comprehensive system for managing stakeholder relationships across research and technical teams. The success of stakeholder engagement will hinge not only on effective strategies but also on championing a structured framework for systematically identifying, understanding, categorizing, and nurturing relationships with diverse stakeholders. A system similar to customer relationship management software can be implemented to facilitate comprehensive management of stakeholder relationships through the entire program cycle, whether at the program level, or BTO-wide.

Communications and Outreach Best Practices

Keep the following best practices in mind when engaging with target stakeholders, especially those from DACs or underrepresented groups who may face additional barriers to participating in clean energy programs. These best practices are intended for BTO teams pursuing a variety of program goals, whether that is greater program visibility or improving participation of traditionally underrepresented groups. These best practices will facilitate an overall engagement strategy that is equitable, accessible, and inclusive of different needs, preferences, cultures, and backgrounds. We provide short descriptions of each along with references, resources, and examples for further reading and a deeper inquiry into each best practice.

Build Strategic Partnerships

Practice Participatory Engagement

Ask Open-Ended Questions

Institutional Review Board

Use Active Listening

Improve Accessibility

Practice Cultural Competency

Use Plain Language

Use Inclusive Language

Use Multichannel Communication

Consider Multimedia Storytelling

Image Credit: Design Trust for Public Space
'Opening the Edge' Public Engagement

Build Strategic Partnerships

Partnering with trusted local leaders, nonprofits, and community-based organizations committed to serving local residents can better center the needs and priorities of the community in the program [67]. Teams should bring these stakeholders in as equal partners in defining problems and co-developing culturally relevant strategies and solutions. In most cases, local leaders occupy elected positions within local government, own small businesses, or lead established community organizations. However, in some cases, these local influencers have garnered recognition through other channels, such as amassing an online following on social media, and are considered a trusted voice for their communities, as well as a local knowledge broker. Local partners can help programs identify opportunities for skill development and capacity building related to clean energy technologies. Similarly, they can champion participation in community meetings and events, such as local lunch and learns, tradeshows and fairs, or business luncheons.

Further Reading:

- State of Washington Department of Health Community Engagement Guide
- Engaging Your Community: A Toolkit for Partnership, Collaboration, and Action
- Partnering with Community-Based Organizations for More Broad-Based Public Engagement
- EXAMPLE: Best Practices for Equitable Engagement from Association of Bay Area Governments Regional Housing Technical Assistance Program

Practice Participatory Engagement

Though teams may be providing technical assistance, do not assume the team can provide all the answers or solutions to a community's unique energy needs. Through awareness of the nuances of a community's dynamics, what they deal with on a day-to-day basis, what the resource base of both physical and social capital is, community members will have insider knowledge and insight that will inform what will best help them in the energy space. Participatory engagement refers to a process where stakeholders—in the context of commercial buildings, this could mean building owner, tenant, or patron—are actively involved in the decision-making, planning, and design of clean energy initiatives or deployment programs. It goes beyond traditional methods of communication and outreach by emphasizing collaboration, inclusion, and shared decision-making. This assures that stakeholder perspectives, concerns, and priorities are considered in the development of clean energy initiatives. Participatory engagement allows for a better understanding of stakeholder needs within a local context, enabling tailored solutions that are more likely to be effective and accepted.

Further Reading:

- Organizing Engagement Models: Dialogue to Change Process

Ask Open-Ended Questions

Whether during surveys, observational research, informal interviews, or feedback-gathering sessions, asking open-ended questions will elicit richer and more detailed responses from stakeholders. When developing questions, be aware of any internal biases toward a particular technology or outcome. Open-ended questions encourage thoughtful discussion and create a welcome space for stakeholders to fully express their thoughts without being constrained by predefined response options. Although closed-ended questions—such as yes or no questions and multiple-choice questions—are useful for obtaining specific details, confirming facts, and narrowing down options, they are usually not conducive to productive dialogue. For example, instead of asking, "Is cost savings a primary factor in your decision-making process?" consider asking, "How do you envision the integration of clean energy technology contributing to the specific needs and operations of your business?" Open-ended questions allow stakeholders to raise issues or considerations that may not have been anticipated by the organization.

Institutional Review Board

Keep in mind that some interactions with stakeholders may require approval from the Institutional Review Board (IRB) for human subjects research. If the stakeholder interactions fit one of the definitions of "research" provided by the IRB and involves human subjects, then the team will be required to complete relevant training, submit an IRB application, and gain IRB approval prior to conducting research.

Research is defined as "a systematic investigation, including research development, testing, and evaluation, designed to develop or contribute to generalizable knowledge" [68]. Systematic investigations follow a predetermined plan to look at a specific issue, test a research question, or develop a new theory. This kind of research could include collecting quantitative or qualitative data, using surveys, interviews or focus groups, or observing behavior.

The term "human subject" refers to a living individual from whom an investigator, engaged in research, acquires information through intervention or interaction. This includes the use, study, or analysis of the obtained information, as well as acquiring, using, studying, analyzing, or generating identifiable private information [68]. A key part of the human subject definition is "about whom". An IRB approval is required if the research focuses on opinions, characteristics, or behavior of an individual. On the other hand, an IRB approval may not be required if the individuals are being asked to provide information about something (e.g., asking for opinions vs. asking about a quantity of solar panels were installed last year). IRB approval is also required if the data collection involved access to identifiable private information [68].

Use Active Listening

When meeting with stakeholders, be careful to guide the discussion but not control the narrative. Be open in the listening process and intentionally practice active listening.

- Practice patience, especially in situations where stakeholders might take time to express themselves.
- Avoid rushing the conversation and allow for natural pauses.
- Use reflective listening techniques, such as mirroring (e.g., repeating back key points at the end of the conversation).
- Offer feedback to confirm understanding. For example, say, "If I understand correctly, you're saying..." This allows the speaker to clarify or provide additional information.
- When engaging with various stakeholders from diverse backgrounds, it is also important to be an effective facilitator in the listening process. Be sure to make space for those whose voices are least heard and provide balance if more vocal participants infringe on others' ability or time to share.

Improve Accessibility

Removing barriers to engagement will allow for greater participation of diverse stakeholders and assure that all participants are comfortable to fully engage. Prioritizing accessibility can mean different things depending on which stakeholder group the team is trying to engage and what their needs are. Some examples are providing communications in a community's primary language, providing flexible and convenient meeting times for stakeholders with limited availability, or providing closed-captioning or live transcription during virtual meetings for those with hearing impairments. Providing information in a variety of formats, such as infographics, audio materials, or visual aids enhances accessibility for individuals with different learning preferences. Acknowledge potential financial barriers by providing support for participation when appropriate, such as offering stipends for community members' time and involvement in information-gathering sessions. Be considerate of DACs or overburdened stakeholders who are engaged in reciprocal communication relationships and who may require compensation or funding for feedback. It should be a priority to not overburden stakeholders and assure that they are benefiting from the relationship as well.

Further Reading:

— Organizing Engagement Principles: Accessibility

— Accessible Public Engagement

— How to Facilitate Inclusive Community Outreach

Practice Cultural Competency

Cultural competency involves building an awareness of and mutual respect for cultural differences and establishing behaviors that demonstrate a commitment towards increasing community agency for change [69]. Before engaging with DACs, consider the histories, intercommunity dynamics, socioeconomic background, values, practices, and belief systems unique to each community [35]. It is also important to consider their relationship to the environment and their approach to energy use, conservation, and consensus-building. Cultural competency allows building technology deployment programs to develop tailored approaches and solutions that are culturally appropriate and sensitive to differences in communication styles. By acknowledging and valuing cultural differences, one can foster trust and create a safe space for open dialogue and engagement [70].

- Use culturally appropriate examples, visuals, and references to establish a connection and resonate with their experiences.
- Even subtle social norms are important, such as having everyone in the room (or virtual room) introduce themselves and where they are from. In some communities, place is an important part of identity; understanding where the people they are engaging with come from provides better context and comfort in communicating.

Further Reading:

— Building Culturally Competent Organizations

Use Plain Language

Plain language is communication that is straightforward and easy to understand. Plain language is crucial when communicating on energy-efficient building technologies because it assures that information is accessible for everyone involved. Disadvantaged communities may have diverse cultural backgrounds, worldviews, educational attainment, and language fluency. Plain language takes this diversity into account by using concise wording and common vocabulary that transcends language barriers. Avoid technical terms, unnecessary jargon, complex sentences, and convoluted language. This could also mean adopting the words or phrases target stakeholders use when seeking energy-related support, services, and products. Not all stakeholders will be familiar with common terminology used by energy efficiency professionals—such as energy retrofit or fuel switching—and by ignoring this, we risk failing to reach the stakeholders that could most benefit from these programs. By using plain language, teams can empower stakeholders to make informed decisions, and to actively participate in discussions on energy efficiency.

Further Reading:

— PlainLanguage.gov

— Five Steps to Plain Language

Use Inclusive Language

Any communication should use inclusive language. Inclusive language means avoiding language that may exclude or offend individuals based on their gender, race, ethnicity, religion, disability, or other characteristics. Inclusive language also acknowledges the unique experiences and challenges faced by DACs. It allows individuals to see themselves reflected in the conversation and encourages them to actively participate in decision-making processes related to energy efficiency.

"In engaging with stakeholders, agencies should consider their obligation under Title VI of the Civil Rights Act of 1964 to ensure meaningful access for individuals with limited English proficiency, as well as their obligation pursuant to Section 504 of the Rehabilitation Act to take appropriate steps to ensure effective communication for individuals with disabilities" [4].

Further Reading:

- Conscious Style Guide
- 18F Inclusive Language Style Guide
- Energy Equity Project Report 2022 (pg. 92-97)

Use Multichannel Communication

Communities, and even individuals within those communities, have very diverse communication preferences. Understand the target demographic and select communication channels that are commonly used and accessible to the community the team is trying to reach. Use a variety of offline and online communication channels. This may include community centers, local newspapers, industry publications, radio stations, text messaging, social media platforms, or community-specific forums. Multichannel communication allows teams to tailor messages to suit the characteristics and expectations of each channel and its audience. For example, social media allows for interactive discussions and community-building, while newsletters provide in-depth information. Local media is better suited for reaching individuals actively seeking information on community-specific resources and current affairs. Using multiple channels enhances overall stakeholder engagement, demonstrates adaptability, and a commitment to reaching stakeholders on their terms [71].

Further Reading:

- Explore Settings, Channels, and Activities
- A systemic approach of communication in multiple stakeholder settings: challenges and future research directions from a multidisciplinary perspective

Consider Multimedia Storytelling

Think beyond the case study and consider interactive ways to share real-life stories that demonstrate the human element of programs. Personal narratives and anecdotal evidence of successful clean energy programs have a powerful way of inspiring action and creating meaning [72]. Employ narrative arcs or plots [73] using a variety of interactive formats, such as short videos, audio clips, maps, photo galleries, and data visualization [74]. Stories tend to elicit an emotional reaction and capture the attention and interest of a variety of audiences, therefore maximizing their reach and positive outcomes on the stakeholders the team is trying to engage.

Further Reading:

- Storytelling for Energy Solutions Toolkit
- Example: Environmental Protection Agency Community Voices on Environmental Justice
- Example: Fresh Energy Clean Energy Stories

Image Credit: Design Trust for Public Space
'Opening the Edge' Public Engagement

Metrics and Best Practices to Support Energy Justice and Equity in Stakeholder Engagement

Strategic stakeholder engagement is key to a program's ability to meet energy justice and equity goals (see Table 8). Developing stakeholder analysis profiles, stakeholder maps, and stakeholder engagement plans allows program teams to improve engagement strategies for more effective involvement from stakeholders or target sectors. The percentage of funding allocated to and overall engagements with target sectors can indicate direct progress toward energy justice and equity goals. Stakeholder feedback should be incorporated into the program for continuous improvement. The following metrics and best practices can be used to track progress towards energy justice and equity or Justice40 goals These metrics and best practices are also featured in the EJE-BEST tool.

Table 8 Stakeholder Engagement Metrics and Best Practices

Stakeholder Analysis Profiles	This best practice indicates the completion of program-specific stakeholder analysis profiles.
Stakeholder Map	This best practice highlights the completion of a stakeholder mapping exercise such as a Power-Interest Matrix or a Stakeholder Engagement Assessment Matrix.
Stakeholder Engagement Plan	This best practice captures the creation of a stakeholder engagement plan that includes specific strategies for engaging with and gathering feedback from target populations and sectors.
Targeted Engagements	This metric tracks what percentage of program engagements were with target populations or sectors.
Multiple Languages	This best practice identifies whether stakeholder engagement is available in multiple languages and, if so, which languages are available.
Budget Percent Reaching Targeted Engagements	This metric identifies the percentage of overall program funding that was allocated for outreach, engagement, and gathering feedback from targeted populations and sectors.
Stakeholder Engagement Process and Success	This metric tracks changes made to the program based on stakeholder feedback.

Energy Justice and Equity in Communications and Outreach Best Practices

Using communication and outreach best practices enhances the effectiveness of a program's stakeholder engagement process. Embracing the use of plain and accessible language as well as using multiple channels to reach stakeholders may broaden a program's reach while promoting fairness and inclusivity in reaching diverse audiences. Teams should make contact information and feedback channels easy to find and use for stakeholders to facilitate decision-making processes can be informed by the voices of all stakeholders (see Table 9). The following best practices can be used to track progress towards energy justice and equity or Justice40 goals. These best practices also appear in the EJE-BEST tool.

Table 9 Stakeholder Engagement Communications and Outreach Best Practices

Easily Accessible Contact Information	This best practice indicates whether the program website features easily accessible contact information and a clear request for feedback from the public.
Plain and Inclusive Language	This best practice indicates whether the program communications have been reviewed for accessible and inclusive language.
Multichannel Engagement	This best practice captures the use of offline and online communication channels, such as local newspapers, industry publications, radio stations, social media platforms, and/or community-specific forms.

Conclusion

The guidance and best practices in this document and the accompanying EJE-BEST deployment and reporting tool were designed to support teams in integrating EJE principles into DOE BTO technology deployment activities. While initially developed for BTO programs, the best practices, recommendations, and approaches provided are applicable to any program focused on the equitable deployment of clean energy technologies. The resources aid technology deployment teams in tracking, reporting, and maximizing the benefits reaching DACs and other target sectors. PNNL intends to continue to improve both this guidance document and the EJE-BEST tool as new information becomes available and in response to user feedback.

Image Credit: Design Trust for Public Space
'Opening the Edge' Public Engagement

Appendix A: Energy Justice and Equity Reporting Methodology

Justice40 and Energy Justice and Equity Reporting

PNNL has developed the EJE-BEST deployment and reporting tool, which can be used to support many of the best practices and EJE approaches outlined in this text. It is in alignment with the *M-21-28 Interim Implementation Guidance for the Justice40 Initiative*, the DOE *General Guidance for Justice40 Implementation Version 1.1*, the *Justice40 Community Benefits Plan* resources, and the *EERE Impact Evaluation Method Guide for Justice40, Equity, and Workforce Diversity Goals* [2] [4] [5] [6].

The EJE-BEST tool allows teams to set a baseline at the beginning of a new program or a new fiscal year. It allows BTO deployment programs to track and report EJE impacts, and Justice40 metrics and best practices with program sponsors.

What should be included in the J40 Report?

"Executive Order 14008 states that '40 percent of the overall benefits' of federal investments from covered programs should flow to disadvantaged communities. To respond to that directive, each agency should establish a methodology for calculating the benefits that a) flow from each applicable covered program and b) accrue in disadvantaged communities from each covered program" [4].

At a minimum, the following information on covered programs should be reported to the DOE Office of Management and Budget by each agency in accordance with the Interim Guidance:

- Agency and Program names and IDs,
- Amount appropriated and obligated,
- Was a stakeholder engagement plan developed (y/n)?
- Was a methodology of J40 benefits submitted (y/n) (date)?
- List of the target J40 benefits of the program,
- % of J40 benefits directed to DACs or Target Sectors (see proposed Equation 1),
- % of J40 benefits directed to non-DAC or non-Target Sector stakeholders (see proposed Equation 3),
- % of J40 benefits with unknown direction (see Equation 4),
- Line-Item Data for the Geographic Distribution of Benefits and Program Funding Amount of program funding directly received by DACs (if any).

The EJE-BEST tool developed by PNNL reports these data and more.

Image Credit: Design Trust for Public Space
'Opening the Edge' Public Engagement

In addition to the list of reporting data required by *M-21-28: Interim Implementation Guidance for the Justice40 Initiative*, the EJE-BEST tool also collects the following information:

- **List of Target Sectors** (e.g., small buildings, community asset buildings, installations supporting Federally Recognized Tribes, non-Federally Recognized Tribes, American Indians, or Alaska Natives),
- **Diversity metrics** for the program team, including any paid external advisors (e.g., gender, racial or ethnic identity),
- Program **Stakeholder Engagement Details**:
  - Organization or contact name,
  - Physical address/census tract or block,
  - Benefits to and from each contact (e.g., was technical assistance provided or were case studies developed?),
  - Building or installation size,
  - Does the building or installation offer benefits to communities (e.g., community asset or resilience hub)?
  - Is the building or installation on land within the boundaries of Federally Recognized Tribes, or non-Federally Recognized Tribes?
- Metrics on **Energy Justice and Equity in Teams and Program Design** (see Table 2),
- Metrics on **EJE Goal Setting** (see Table 5),
- Metrics on **Program Target Sector Details** (see Table 4),
- Metrics on **Knowledge Development** (see Table 6),
- Metrics on **Technical Assistance** or **Energy Advising** (see Table 7),
- Metrics on **Stakeholder Engagement** (see Table 8 and Table 9).

The EJE-BEST tool includes three compiled reports:

1. A **Justice40 Report** which can be shared with BTO program sponsors,
2. A **Team Progress Planning Report** that the program team can use for advancing, improving, and enhancing energy justice and equity strategies,
3. A **Tool Feedback Report** that compiles feedback on the use of the tool, metrics, or any other aspects of the EJE-BEST which can be shared with BTO program sponsors or PNNL.

The EJE-BEST tool reports an estimated percent of the overall benefits of federal investments from the program that flows to DACs via target sector buildings. The tool uses the following methodology based on the flow of J40 benefits to target sectors outlined in Table 3.

Equation 1 Flow of J40 Benefits to Target Sectors

The estimated percent of the overall **J40 benefits** of federal investments from the program that flows to **target sectors** (B_{TS}) is determined using the following formula:

$$\mathbf{B_{TS} = (TF_{PCD1} * PCD_{TS1}) + (TF_{PCD2} * PCD_{TS2}) + \ldots + (TF_{PCD\infty} * PCD_{TS\infty})}$$

where,

B = **J40 benefits** (e.g., those that result from direct outcomes on the primary aligned goal(s) of the program)

TS = **Target sectors**

TF = The **total funding** allocated to the program in this reporting period or fiscal year

PCD = **Program component** (e.g., elements or areas of focus of the program that have unique outcomes such as project management, administration, work on knowledge development, stakeholder engagement, work to support a recognition program, or travel) with **direct flow of J40 benefits**

TF_{PCD} = The **percent of total funding** allocated to a **program component** with **direct flow of J40 benefits**

PCD_{TS} = The percent of the **direct benefit program component** efforts that reached **target sectors** (e.g., technical assistance offered to target sectors / total technical assistance offered).

Equation 2 Flow of J40 Benefits to Target Sectors in Disadvantaged Communities

The estimated percent of the overall **J40 benefits** of federal investments from the program that flows to **target sectors located within DACs** (B_{TSDAC}) is determined using the following formula:

$$B_{TSDAC} = (TF_{PCD1} * PCD_{TSDAC1}) + (TF_{PCD2} * PCD_{TSDAC2}) + \ldots + (TF_{PCD\infty} * PCD_{TSDAC\infty})$$

where,

B = **J40 benefits** (e.g., those that result from direct impacts on the primary aligned goal(s) of the program)

TS = **Target sectors**

TF = The **total funding** allocated to the program in this reporting period or fiscal year

PCD = **Program component** (e.g., elements or areas of focus of the program that have unique outcomes such as project management, administration, work on knowledge development, stakeholder engagement, work to support a recognition program, or travel) with **direct flow of J40 benefits**

TF_{PCD} = The **percent of total funding** allocated to a **program component** with **direct flow of J40 benefits**

PCD_{TSDAC} = The percent of the **direct benefit program component** efforts that reached **target sectors** located within **DACs** (e.g., technical assistance offered to target sectors / total technical assistance offered)

Equation 3 Flow of J40 Benefits to Non-Target Sectors

The estimated percent of the overall **J40 benefits** of federal investments from the program that flows to **non-target sectors** (B_{NTS}) is determined using the following formula:

$$B_{NTS} = (TF_{PCD1} * PCD_{NTS1}) + (TF_{PCD2} * PCD_{NTS2}) + \ldots + (TF_{PCD\infty} * PCD_{NTS\infty})$$

where,

B = **J40 benefits**

NTS = **Non-target sectors**

TF = The **total funding** allocated to the program in this reporting period or fiscal year

PCD = **Program component** (e.g., elements, or areas of focus, of the program that have unique outcomes such as project management, administration, work on knowledge development, stakeholder engagement, work to support a recognition program, or travel) with **direct flow of J40 benefits**

TF_{PCD} = The **percent of total funding** allocated to a **program component** with **direct flow of J40 benefits**

PCD_{NTS} = The percent of the **direct benefit program component** efforts that reached **non-target sectors** (e.g., technical assistance offered to non-target sectors / total technical assistance offered)

Equation 4 Resources with Unknown Flow of Benefits

The estimated percent of the overall federal investments from the program with **unknown or indirect flow of J40 benefits** (B_U) is determined using the following formula:

$$\mathbf{B_U = (TF_{PCU1}) + (TF_{PCU2}) + \ldots + (TF_{PCU\infty})}$$

where,

B = **J40 benefits**

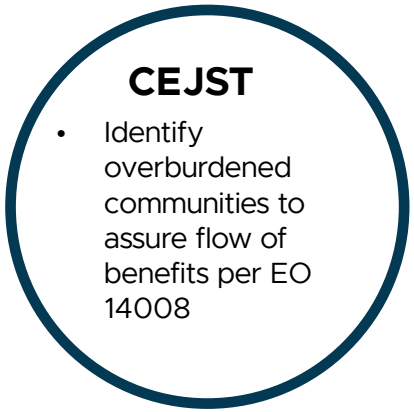
U = **Unknown or indirect** flow

TF = The **total funding** allocated to the program in this reporting period or fiscal year

PCU = **Program component** (e.g., elements, or areas of focus, of the program that have unique outcomes such as project management, administration, work on knowledge development, stakeholder engagement, work to support a recognition program, or travel) with **unknown or indirect flow of J40 benefits**

TFPCU = The **percent of total funding** allocated to a **program component** with **unknown or indirect flow of J40 benefits**

Appendix B: More on the Climate and Economic Justice Screening Tool



CEJST methodology[9] – how is it calculated?

Threshold methodology that looks across multiple categories of indicators.

M-23-09 states that "Federal agencies should now start using the **White House Climate and Economic Justice Screening Tool (CEJST)** to identify geographically defined disadvantaged communities for any covered programs under the Justice40 Initiative and for programs where a statute directs resources to disadvantaged communities, to the maximum extent possible and permitted by law" [3].

Is race included in the CEJST dataset?

"No. The Climate and Economic Justice Screening Tool (CEJST) does not use racial demographics in its methodology. The current version of the tool displays data about race and age only to provide information when a census tract is selected. It is well-documented that communities of color suffer disproportionately from environmental and health burdens. Due to decades of underinvestment, they also face greater risks from climate change" [47].

How does the tool identify and define communities?

"Communities are considered disadvantaged:

- If they are in a census tract that meets the thresholds for at least one of the tool's categories of bur-den, or
- If they are on land within the boundaries of Federally Recognized Tribes" [47].

Burden Categories used in CEJST

"Generally, a census tract that meets the threshold for: 1) environmental, climate, or other burdens, and 2) an associated socioeconomic burden will be marked as disadvantaged. CEJST considers the following eight categories of burden:

1. climate change,
2. energy,
3. health,
4. housing,
5. legacy pollution,
6. transportation,
7. water and wastewater, and
8. workforce development.

In addition, a census tract that is completely surrounded by disadvantaged communities and is at or above the 50% percentile for low income is also considered disadvantaged" [5].

[9] https://screeningtool.geoplatform.gov/en/#3/33.47/-97.5

Image Credit: Design Trust for Public Space
'Opening the Edge' Public Engagement

STAKEHOLDER PROFILES

ROLE: DECISION-MAKER | PRIMARY STAKEHOLDER

SMALL COMMERCIAL BUILDING OWNER

What do they care about? What drives them?	What challenges do they experience?	What do they need to overcome those challenges?	Communication preferences and professional networks
• Property value and appreciation • Asset protection • Minimizing liability risks • Keeping maintenance costs low while maximizing value to tenants • Improving feelings of safety in building • Reducing time dedicated to building maintenance and upkeep	• Justifying cost of energy efficiency upgrades and retrofits, without passing cost to tenants • Lack of awareness of role in energy equity • Securing loans and low-cost capital towards energy efficiency upgrades • Limited awareness of gov incentives and financing options for energy efficiency upgrades (CPACE*, green banking, Energy Savings Performance Contract, Community development financial institutions…)	• Utility and government incentives • Assistance complying with building energy codes • Understanding the Return on Investment (ROI) of energy efficiency upgrades • Financing • Environmental, Social, and Governance Awareness	• Local business journals • Local media • Social Media (LinkedIn, Facebook) • General Services Administration • Building Owners and Managers Association • International Facility Management Assoc. • Institute of Real Estate Managers (IREM)

* Commercial property-assessed clean energy (CPACE)

Goals and Desired Outcomes

Building owner accesses information on costs, expected payback, non-energy impacts (such as decreased maintenance and tenant retention), and available incentives for retrofit programs. They are inspired by peers and pledge to pursue an energy efficiency retrofit now or in the future.

Example Engagement Methods

- Professional recognition
- Peer-to-peer networking
- Pledge initiative
- Awareness campaigns

Example Key Messages

- Upgrade your insulation, lighting system, or HVAC to instantly reduce operating costs and improve the value of your commercial property. Join the [technology deployment program], take the pledge, and get recognized as an energy efficiency leader.
- Are you a small building owner serving a disadvantaged community? DOE's [technology deployment program] can connect you with available financial incentives and make energy-saving upgrades more affordable for you.
- Want to attract and retain tenants for your commercial building? Learn how these technologies can help reduce maintenance costs while providing a desirable commercial space to lease through DOE's [technology deployment program].

Example Communication Products

- Cost-benefit analysis of energy efficient building technology
- Directory of government incentives
- Directory of green building certifications
- Educational materials on financing
- Guide to understanding meter readings, energy usage reports, and utility bill statements

ROLE: BENEFICIARY | PRIMARY STAKEHOLDER

COMMERCIAL TENANT

What do they care about? What drives them?	What challenges do they experience?	What do they need to overcome those challenges?	Communication preferences and professional networks
• Keeping utility bill costs low • Customer satisfaction • Employee productivity and comfort • Company values • Business revenue	• Configuring and maintaining building technologies for maximum efficiency • Little or no control or ownership over building energy retrofits • Limited knowledge of energy efficiency measures and technologies • Lack of internal capacity to prioritize and pursue energy efficiency measures • Getting buy-in from building owner	• Technical support • Energy Savings Audit • Mediation • Learning how to negotiate a green lease	• Local business journals • Real estate guides • Social Media (LinkedIn, Facebook, Instagram) • Business networking groups and chambers of commerce • Small business development centers and organizations • Tenants' associations • DOC's Minority Business Development Agency • Small Business Administration

Goals and Desired Outcomes

Business tenants in underinvested neighborhoods are empowered with proven and practical information they can use to petition their landlord for building technology upgrades or retrofits. These efforts seamlessly integrate with similar business goals and do not interfere with revenue-generating activities and continued function.

Example Engagement Methods

- Technical assistance
- Awareness campaigns
- Ad-hoc mediation services

Example Key Messages

- Interested in reducing your business' operating costs? [Technology deployment programs] can connect you with the financial incentives available to make energy-saving upgrades possible for you– saving your business money in the long run while garnering national recognition.
- Want to help make your business and building more energy efficient? Learn about how [technology deployment program] can connect you with the key resources and financial incentives to improve your building's energy efficiency and drive savings.

Example Communication Products

- Messaging guides
- Technology fact sheets
- Energy efficiency audit how-to

FACILITIES MANAGER

ROLE: INFLUENCER | PRIMARY STAKEHOLDER

What do they care about? What drives them?	What challenges do they experience?	What do they need to overcome those challenges?	Communication preferences and professional networks
• Curb appeal, keeping spaces clean, safe, and well-maintained • Professional pride and satisfaction • Expanding building tech skills • Address property and tenant priorities	• Securing buy-in and budget for recommended building upgrades • Forecasting future building system upgrades • Supporting participating in building upgrade programs and ongoing Operations and Maintenance • Reducing inconvenience to tenants • Budget constraints	• Skills training (e.g., technical and building the business case) • Workforce development	• Trade organizations • Unions • Online forums • General Services Administration • Trade shows and vendor fairs

Goals and Desired Outcomes

Facility and grounds managers are empowered to champion energy efficiency retrofits and understand their role in advancing equitable outcomes in the communities where they work.

Example Engagement Methods

- Peer-to-peer networking
- Expert presentations
- Professional recognition
- Workforce development programs

Example Key Messages

- Stand out from your peers and improve your internal reputation. DOE's [technology deployment program] provide facility managers with networking opportunities and technical resources needed to secure buy-in and make your job easier.
- Partnering with us to access these incentives will make the investment in energy-efficient building technologies more feasible and financially advantageous for the building owners.

Example Communication Products

- Messaging guides
- Tip sheets
- Technical resources
- Video testimonials and demos

COMMUNITY-BASED ORGANIZATIONS

ROLE: FACILITATOR | STRATEGIC PARTNERS

What do they care about? What drives them?	What challenges do they experience?	What do they need to overcome those challenges?	Target Organizations
• Advocating for disadvantaged communities and small businesses that support black, indigenous, and other people of color • Address urgent community priorities • Mitigating high energy costs • Generating local wealth • Local economic development • Climate resilience • Equitable access to resources	• Funding and budgetary constraints • Stakeholder engagement and awareness • Local program visibility • Easily applying for state and federal grants • Limited capacity to participate in formal policy processes • Ability to prioritize energy efficiency when addressing urgent needs such as housing and food insecurity	• Grant application assistance • Technical assistance • Accessible educational materials • Decision-making power • Compensation **Communication preferences and professional networks** • Social Media • Local media • Local business journals • In-person resource events	• Community Action Agencies • Community Development Centers • Small Business Development Centers • Business Improvement Districts • Chambers of Commerce • Downtown or Neighborhood Association • Economic Development Councils

Goals and Desired Outcomes

Community-based organizations are strategic partners and trusted messengers in engaging with small businesses and building owners. They are given the support and resources needed to seamlessly integrate [technology deployment program] into existing programs and community outreach activities.

Engagement Methods

- Expert presentations
- Advisory groups
- Ad-Hoc technical consulting
- Partnership building

Example Key Messages

- This partnership not only strengthens your organization's reputation but also expands its reach and influence in advocating for positive change.
- Partner with us to develop programs that promote energy-efficient building retrofits in your community. By improving the energy efficiency of buildings, we can help reduce energy costs for residents and businesses, freeing up resources for other essential needs and contributing to overall community resilience.
- DOE's tech campaigns can augment your current programs, connect you to funding, and help you navigate complicated regulatory frameworks. Together, we can leverage resources to maximize the impact of our collective efforts.

Example Communication Products

- Listing of traditional, alternative, and novel financing models for funding commercial retrofits, such as energy as a service (EaaS), CPACE*, Energy Performance Contracts, Grants

* Commercial property-assessed clean energy (CPACE)

ENERGY AND ENVIRONMENT ORGANIZATIONS

ROLE: FACILITATOR | STRATEGIC PARTNERS

What do they care about? What drives them?	What challenges do they experience?	What do they need to overcome those challenges?	Target Organizations
• Sustainability and decarbonization • Increasing adoption of energy efficient building technologies • Promoting new and relevant information to engineers, scientists, program managers, and professionals in the industry	• Scaling adoption of new technologies • Backing up their claims with data and case studies • Visibility and engagement within target stakeholder groups	• Improved public-private partnerships to showcase technologies • Results from field demonstrations and lab testing	• Regional energy efficiency organizations • Energy services companies (ESCOs) • Weatherization programs

Goals and Desired Outcomes

Local and regional energy organizations find value in developing longstanding relationships with technology deployment programs. Both entities co-develop and share education and technical resources and collaborate on strategic initiatives aimed at enabling equitable outcomes for all communities and stakeholders.

Example Engagement Methods

- Expert presentations
- Advisory groups
- Ad-Hoc technical Consulting
- Partnership building

Example Key Messages

- The Department of Energy is supporting deployment of technologies and approaches that will transform the energy efficiency and resilience of our nation's buildings. Learn more about how [technology deployment programs] are transforming our markets for building decarbonization and how you can become a partner.
- The DOE's [technology deployment program] is partnering with organizations to champion high efficiency building technologies. Partner with our [technology deployment programs] across commercial buildings and connect your programs to the technical and financial resources for energy efficient technologies that can strengthen the impact of your programs.

Example Communication Products

- Listing of traditional, alternative, and novel financing models for funding commercial retrofits, such as energy as a service (EaaS), Commercial property-assessed clean energy (CPACE), Energy Performance Contracts, Grants
- Technical Resources

ROLE: DECISION-MAKER | STRATEGIC PARTNERS

LOCAL GOV ENERGY AND SUSTAINABILITY OFFICES

What do they care about? What drives them?	What challenges do they experience?	What do they need to overcome those challenges?	Communication preferences and professional networks
• Supporting local energy efficiency policy • Modernizing local building energy codes • Incentivizing the development of new properties and rehab of distressed properties • Local economic development, zoning, and permitting • Satisfying constituent expectations for funding capital improvements to public/city-owned buildings • Effective administration of federal programs	• Budgetary constraints • Prioritizing budget allocations • Constituent pushback • Balancing fiscal responsibility with community vision and long-term goals • Limited awareness of building energy retrofits and technologies vs. energy conservation measures	• Access to federal funds • Awareness campaigns • Subject matter expertise	• Local media • Local business journals • Chambers of Commerce • Social Media • In-person or virtual community forums • Department of Energy

Goals and Desired Outcomes

Policymakers in energy and sustainability understand potential of energy efficient building technologies to advance energy equity in the communities they serve. They have the requisite technical knowledge to deploy these technologies to advance energy justice and equity. As a result, they prioritize equity-eligible buildings and disadvantaged communities to receive federal funding for clean energy initiatives. They consult and include community leaders and support community-led clean energy initiatives. They readily share data to identify underinvested commercial buildings and coordinate across agencies to streamline services for constituents.

Engagement Methods

- Expert presentations
- Ad-Hoc technical consulting
- DOE community programs

Example Key Messages

- DOE is working to reduce energy use across buildings through new and emerging technologies, and with a special interest in disadvantaged communities. Learn more about the DOE [technology deployment program] and how your community can access resources and receive technical assistance for reducing energy use in your community's buildings.
- Do you have existing programs targeting building energy efficiency and disadvantaged communities? Learn more about the resources and technical assistance DOE's [technology deployment program] provide and how we can partner to increase the visibility and strategic impact of your programs in the commercial building space.

Example Communication Products

- Policy Memos
- Think Piece

ROLE: INFLUENCER | SECONDARY STAKEHOLDER

BUILDERS AND CONTRACTORS

What do they care about? What drives them?	What challenges do they experience?	What do they need to overcome those challenges?	Communication preferences and professional networks
• Client satisfaction • Code compliance • Innovative building strategies • Profit • Publicity/recognition	• Hiring and retaining a skilled workforce • Acquiring new business • Staying competitive • Credentialing and training • Reconciling costs of clean energy technology with program budget	• Workforce training programs • Energy Justice and Equity (EJE) as a competitive advantage • Publicity and recognition	• Professional associations • Trade organizations • Local business journals • Local media • Online forums • General Services Administration

Goals and Desired Outcomes

Builders and contractors are equipped to promote, commission, and install novel energy efficient building technologies. Additionally, they hire a diverse workforce, subcontractors, and routinely invest in their employees to train on new clean energy technologies.

Example Engagement Methods

- Peer-to-peer networking
- Professional recognition
- Workforce training

Example Key Messages

- We are interested in learning more about the existing suite of technologies that you currently use and how the DOE [technology deployment program] can support your organization's efforts of driving energy efficiency while providing quality installations. Join the [technology deployment program] and gain access to free technical resources and financial incentives for [technology].
- With increasing emphasis on sustainability in construction practices, builders and contractors who proactively integrate energy efficiency, equity, and workforce development initiatives into their operations can gain a competitive advantage and stand out as industry leaders. Let [technology deployment program] give you the tools and resources you need to keep up with emerging industry and federal priorities.

Example Communication Products

- Educational videos
- Listing of building certifications
- Fact sheet on building performance standards
- Demonstration project results
- Case studies

ROLE: DECISION-MAKER | SECONDARY STAKEHOLDER

COMMERCIAL REAL ESTATE DEVELOPERS

What do they care about? What drives them?	What challenges do they experience?	What do they need to overcome those challenges?	Communication preferences and professional networks
• Making profitable investments • Developing desirable properties • Community pride • Legacy	• Securing financing for developing new properties or purchasing distressed properties in underinvested communities or tertiary markets • Community outreach and buy-in	• Subsidies • Land use determinations • Equitable lending policies • Tax incentives (Community development financial institutions) • Energy equity education	• Real estate guides • Social media (LinkedIn, Facebook) • Visitor and convention bureaus • Local business journals • Commercial Real Estate Development Association

Goals and Desired Outcomes

Commercial real estate developers are motivated to invest in distressed properties and energy efficiency retrofits in underinvested neighborhoods for the benefit of the community residents and future occupants. They are inspired by success stories of like-minded peers who have successfully completed similar programs with a high social and monetary return.

Engagement Methods

- Peer-to-peer networking
- Professional recognition
- Awareness campaigns

Example Key Messages

- Developers have the power to alleviate energy poverty, reduce utility costs for residents, and contribute to a more equitable and sustainable future for the community.
- Energy efficiency retrofits not only benefit the community but also provide long-term cost savings and increased property value for developers. Energy-efficient properties have higher market value and can attract a broader range of potential buyers or tenants.
- By investing in distressed properties and retrofitting them for energy efficiency, developers can position themselves as leaders in responsible real estate development, attracting tenants and investors who prioritize community impact.

Example Communication Products

- Equitable site selection guide
- Case studies
- Webinars on Inclusion, Diversity, Equity, and Access

BANKS, FINANCIAL, AND LENDING INSTITUTIONS

ROLE: DECISION-MAKER | SECONDARY STAKEHOLDER

What do they care about? What drives them?	What challenges do they experience?	What do they need to overcome those challenges?	Communication preferences and professional networks
• Underwriting successful capital improvement projects • Deploying Community Reinvestment Act (CRA) capital • Making sound investments and minimizing risk • Contributing towards local small business economy • Complying with commercial lending regulations • Meeting Environmental, Sustainability and Governance ("ESG") financing goals	• Interpreting creditworthiness based on traditional underwriting models • Overcoming bias towards traditional business investments	• Understanding Return on Investment (ROI) and payback of energy efficiency building technologies	• Financial and commercial industry media • Local business journals • Better Business Bureau • Federal Deposit Insurance Corporation

Goals and Desired Outcomes

Lenders (banks, credit unions) can equitably service customers with limited access to capital for energy efficiency projects and retrofit. Lenders have the knowledge and information products required to educate potential borrowers on retrofits and upgrades. They bolster their reputation as leaders in climate/energy through their investments.

Engagement Methods

- Awareness campaigns

Example Key Messages

- Energy-efficient retrofits can help mitigate financial risks associated with small commercial buildings in underinvested communities. By reducing energy consumption and operating costs, these upgrades enhance the financial stability of businesses and improve loan repayment prospects. Furthermore, energy efficiency measures can enhance the value of the building, providing an additional layer of collateral security.
- Are you a financial lending institution with a successful track record of underwriting energy efficiency retrofits in underinvested communities? We want to recognize you! Join the campaign and help industry peers learn from your success and tap into a new and growing market segment!

Example Communication Products

- Case studies on equitable lending
- Cost-benefit analysis of energy efficient building technology

[1] Community Research Lab, "A short guide to community based participatory action research," Healthy City, 2011.

[2] Department of Energy (DOE), "General Guidance for Justice40 Implementation," DOE, Washington, DC, 2022.

[3] S. D. Young, B. Mallory and A. Zaidi, "M-23-09 - Addendum to the Interim Implementation Guidance for the Justice40 Initiative, M-21-28, on using the Climate and Economic Justice Screening Tool (CEJST)," Executive Office of the President, Washington, DC, 2023.

[4] S. D. Young, B. Mallory and G. McCarthy, "M-21-28 Interim Implementation Guidance for the Justice40 Initiative," Executive Office of the President, Office of Management and Budget, Washington, DC, 2021.

[5] DOE Office of Energy Justice and Equity, "Justice40 Initiative," 16 December 2023. [Online]. Available: https://www.energy.gov/justice/justice40-initiative.

[6] DOE Office of Energy Efficiency & Renewable Energy, "EERE Impact Evaluation Method Guide for Justice 40, Equity, and Workforce Diversity Goals," DOE Office of Energy Efficiency & Renewable Energy, Washington DC., 2023.

[7] Executive Office of the President, Executive Order 12898: Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations, Washington, DC: Executive Office of the President, 1994.

[8] Executive Office of the President, Executive Order 14008: Tackling the Climate Crisis at Home and Abroad, Washington, DC: Executive Office of the President, 2021.

[9] DOE Office of Justice and Equity, "DOE Justice40 Covered Programs," 16 Dec 2023. [Online]. Available: https://www.energy.gov/justice/doe-justice40-covered-programs.

[10] Executive Office of the President, Executive Order 14096: Revitalizing Our Nation's Commitment to Environmental Justice for All, Washington, DC: Executive Office of the President, 2023.

[11] DOE Office of Energy Justice and Equity, "Justice40 Initiative Environmental Justice Fact Sheet," 25 July 2022. [Online]. Available: https://www.energy.gov/sites/default/files/2022-07/Environmental%20Justice%20Explainer%207_25_22.pdf.

[12] DOE Office of Energy Efficiency & Renewable Energy, "Energy Equity and Environmental Justice," [Online]. Available: https://www.energy.gov/eere/energy-equity-and-environmental-justice#:~:text=While%20DOE%20has%20helped%20bring,of%20electric%20vehicle%20income%20credits. [Accessed 25 January 2024].

[13] S. Rajpurohit, E. Said and K. Kennedy, "Improving the American Indoors: The Health, Economic, and Community Benefits of Zero-Carbon Buildings," America is All In, 2022.

[14] University of Michigan School for Environment and Sustainability, "Energy Equity Project Framework Report, v1.0," University of Michigan, Ann Arbor, MI, 2022.

[15] K. Jenkins, "Setting energy justice apart from the crowd: Lessons from environmental and climate justice," Energy Research & Social Science, pp. 117-121, 2018.

[16] B. K. Sovacool and M. H. Dworkin, "Energy justice: Conceptual insights and practical applications," Applied Energy, pp. 435-444, 2015.

[17] P. Romero-Lankao and E. Nobler, "Energy Justice: Key Concepts and Metrics relevant to EERE Transportation Projects," NREL, 2021.

[18] DOE Office of Energy Justice and Equity, "Office of Energy Justice and Equity," 3 January 2022. [Online]. Available: https://www.energy.gov/justice/articles/how-energy-justice-presidential-initiatives-and-executive-orders-shape-equity-doe.

[19] S. Baker, S. DeVar and S. Prakash, "The Energy Justice Workbook," Initiative for Energy Justice, 2019.

[20] G. Walker and R. Day, "Fuel poverty as injustice: Integrating distribution, recognition and procedure in the struggle for affordable warmth," Energy Policy, pp. 69-75, 2012.

[21] C. Ruano-Chamorro, G. G. Gurney and J. E. Cinner, "Advancing procedural justice in conservation," Conservation Letters, 2021.

[22] M. Hazrati and R. Heffron, "Conceptualising restorative justice in the energy Transition: Changing the perspectives of fossil fuels," Energy Research & Social Science, 2021.

[23] R. J. Heffron and D. McCauley, "The concept of energy justice across the disciplines," Energy Policy, vol. 105, pp. 658-667, 2017.

[24] D. McCauley, V. Ramasar, R. Heffron, B. Sovacool, D. Mebratu and M. Luis, "Energy justice in the transition to low carbon energy systems: Exploring key themes in interdisciplinary research," Applied Energy, no. 233-234, pp. 916-921, 2019.

[25] DOE Office of Energy Justice and Equity, "How Energy Justice, Presidential Initiatives, and Executive Orders Shape Equity at DOE," 2022. [Online]. Available: https://www.energy.gov/justice/articles/how-energy-justice-presidential-initiatives-and-executive-orders-shape-equity-doe. [Accessed 29 January 2024].

[26] L. Hoory and C. Bottorff, "Agile Vs. Waterfall: Which Project Management Methodology Is Best For You?," 10 Aug 2022. [Online]. Available: https://www.forbes.com/advisor/business/agile-vs-waterfall-methodology/#:~:text=Waterfall%20is%20a%20better%20method,will%20look%20before%20they%20start..

[27] A. Dwelley, K. Soares, J. Kurman-Faber, N. Dodson, J. Mahr and G. Watson, "Delivering on Justice 40: Perspectives from State Agency Staff. What can federal agencies, technical assistance providers, and advocates do to help states mobilize - and communities access - federal funding?," Climate XChange & Environmental Policy Innovation Center, 2023.

[28] S. Vogel, "Co-Creating a More Equitable World: The Transformative Benefits of Participatory Design," 31 March 2021. [Online]. Available: https://d-lab.mit.edu/news-blog/blog/co-creating-more-equitable-world-transformative-benefits-participatory-design.

[29] Executive Office of the President, "Executive Order 14035: Executive Order on Diversity, Equity, Inclusion, and Accessibility in the Federal Workforce," Executive Office of the President, Washington DC, 2021.

[30] Centers for Disease Control and Prevention, "Training and Professional Development: Technical Assistance," 22 December 2023. [Online]. Available: https://www.cdc.gov/healthyschools/professional_development/videos/pd101/05-technical_assistance.pdf.

[31] DOE Office of State and Community Energy Programs, "Low-Income Community Energy Solutions," 18 December 2023. [Online]. Available: https://www.energy.gov/scep/slsc/low-income-community-energy-solutions#:~:text=Energy%20burden%20is%20defined%20as.

[32] DOE EERE Building Technologies Office, "Small Buildings = Big Opportunity for Energy Savings," U.S. DOE EERE Building Technologies Office, Washington DC, 2013.

[33] R. Langner, B. Hendron and P. Shanti, "Industry Research and Recommendations for Small Buildings and Small Portfolios," National Renewable Energy Laboratory (NREL), Golden, CO, 2013.

[34] A. Clarke, M. Deru, E. Lockhart, L. Beshilas, G. Paranjothi, N. Wiltse, S. Belding, R. Jackson, N. Radhakrishnan, M. Egea-Casalduc, K. Grimes and B. Engelman, "Centering Energy and Environmental Justice in the Buildings Energy Sector," National Renewable Energy Laboratory, Golden, CO, 2023.

[35] K. Dombrovski, M. McIntyre and F. Jimenez, "A guide to engaging underserved communities in commercial energy efficiency field validations," National Renewable Energy Laboratory (NREL), Golden, CO, 2023.

[36] K. Kobe, "Small Business GDP: Update 2002-2010," Small Business Administration Office of Advocacy, Washington, DC, 2012.

[37] C. Antonopoulos, C. Miller, E. Mayhorn, N. Irshad, R. Klenner and S. Biswas, "Decarbonizing the Building Sector: A Human-Centered Study Focused on Small/Light Commercial Building Energy Equity," in 2022 ACEEE Summer Study on Energy Efficiency in Buildings, Pacific Grove, CA, 2022.

[38] C. Flora and J. Flora, Rural Communities: Legacy and Change (3rd Edition), Boulder, CO: Westview Press, 2008.

[39] UCLA Center for Health Policy Research, "Section 1: Asset Mapping," 22 December 2023. [Online]. Available: https://healthpolicy.ucla.edu/sites/default/files/2023-08/tw_cba20.pdf.

[40] C. Jacobs, "Measuring Success in Communities: Understanding the Community Capitals Framework," South Dakota State University: Open PRAIRIE, Brookings, SD, 2011.

[41] J. L. McKnight and J. P. Kretzmann, "Mapping Community Capacity," Center for Urban Affairs: Northwestern University, Evanston, IL, 1990.

[42] DOE Office of Energy Efficiency and Renewable Energy, "Decarbonizing the U.S. Economy by 2050: A National Blueprint for the Building Sector," 22 December 2023. [Online]. Available: https://www.energy.gov/eere/decarbonizing-us-economy-2050-national-blueprint-building-sector.

[43] DOE Better Buildings, "Improve Community Resilience," 22 December 2023. [Online]. Available: https://betterbuildingssolutioncenter.energy.gov/resilience/communities. [Accessed 14 January 2024].

[44] DOE Better Buildings, "Shelter from the Storm: Powering Community Resilience Hubs," 21 December 2023. [Online]. Available: https://betterbuildingssolutioncenter.energy.gov/webinars/shelter-storm-powering-community-resilience-hubs. [Accessed 14 January 2024].

[45] D. Hernandez, "Understanding 'energy insecurity' and why it matters to health," Social Science & Medicine, vol. 167, pp. 1-10, 2016.

[46] DOE American Made Challenges, Buildings UP (The Buildings Upgrade Prize) - Phase 2: Plan Phase Official Prize Rules, Washington, DC: DOE American Made Challenges, 2023.

[47] The White House Council on Environmental Quality , "Frequently Asked Questions," 16 December 2023. [Online]. Available: https://screeningtool.geoplatform.gov/en/frequently-asked-questions.

[48] U.S. Energy Information Administration, "Household Energy Insecurity, 2015 Residential Energy Consumption Survey (RECS). Table HC11.1," U.S. Energy Information Administration, 2015.

[49] Initiative for Energy Justice, "Section 1 – Defining Energy Justice: Connections to Environmental Justice, Climate Justice, and the Just Transition," 18 December 2023. [Online]. Available: https://iejusa.org/section-1-defining-energy-justice/.

[50] L. Middlemiss and R. Gillard, "Fuel poverty from the bottom-up: Characterising household energy vulnerability through the lived experience of the fuel poor," Energy Research & Social Science, pp. 146-154, 2015.

[51] The White House Council on Environmental Quality (CEQ), "Methodology," 16 December 2023. [Online]. Available: https://screeningtool.geoplatform.gov/en/methodology.

[52] U.S. Department of Transportation, "Equity and Justice40 Analysis Tools," 18 September 2023. [Online]. Available: https://www.transportation.gov/grants/dot-navigator/equity-and-justice40-analysis-tools.

[53] U.S. Environmental Protection Agency, "What is EJScreen?," 26 June 2023. [Online]. Available: https://www.epa.gov/ejscreen/what-ejscreen.

[54] S. Berkouwer and J. Dean, "Barriers to Energy Efficiency Adoption in Low-Income Communities," Kleinman Center for Energy Policy, Philadelphia, PA, 2021.

[55] L. Bourne, "Targeted Communication: The Key to Effective Stakeholder Engagement," Procedia - Social and Behavioral Sciences, vol. 226, pp. 431-438, 2016.

[56] M. B. Mark Aakhus, "Stakeholder engagement as communication design practice," Journal of Public Affairs, vol. 15, no. 2, pp. 188-200, 2015.

[57] U.S. DOE Better Buildings, "Community-Based Social Marketing Toolkit," U.S. DOE Better Buildings, Washington DC, 2017.

[58] R. E. Freeman, Strategic Management: A Stakeholder Approach, Cambridge University Press, 1984.

[59] DOE American Made Challenges, Buildings UP: The Buildings Upgrade Prize, Washington DC: DOE American Made Challenges, 2023.

[60] O. Č. Martin Cenek, "A Survey of Stakeholder Visualization Approaches," Central European Journal of Management, vol. 2, 2015.

[61] P. S. Ruth Murray-Webster, "Making Sense of Stakeholder Mapping," PM World Today, vol. 8, no. 11, 2006.

[62] Project Management Institute, "Stakeholder Analysis using the Power Interest Grid," 14 April 2023. [Online]. Available: https://www.projectmanagement.com/wikis/368897/stakeholder-analysis--using-the-power-interest-grid#_=_.

[63] M. P. David Usifo (PSM, "Stakeholder Engagement Assessment Matrix in Project Management," Dee Project Manager, 12 November 2023. [Online]. Available: https://deeprojectmanager.com/stakeholder-engagement-assessment-matrix/.

[64] Project Management Institute, PMBOK® Guide, 7th Edition ed., 2021.

[65] Center on Great Teachers & Leaders, December 2014. [Online]. Available: https://gtlcenter.org/learning-hub/equitable-access-toolkit/stakeholder-engagement-guide.

[66] DOE Office of Fossil Energy and Carbon Management, "Creating a Community and Stakeholder Engagement Plan," DOE Office of Fossil Energy and Carbon Management, Washington DC, 2022.

[67] A. D. A. D. Roxana Ayala, "Fostering Equity Through Community-Led Clean Energy Strategies," American Council for Energy-Efficiency Economy, Washington, D.C., 2021.

[68] National Archives - Code of Federal Regulations, "45 CFR 46 - Protection of Human Subjects," 19 January 2017. [Online]. Available: https://www.ecfr.gov/on/2018-07-19/title-45/subtitle-A/subchapter-A/part-46. [Accessed 29 December 2023].

[69] D. Bergstrom, K. Rose, J. Olinger and K. Holley, "The Sustainable Communities Initiative," PolicyLink, Oakland, CA, 2012.

[70] Community Tool Box, "Section 7. Building Culturally Competent Organizations," 18 December 2023. [Online]. Available: https://ctb.ku.edu/en/table-of-contents/culture/cultural-competence/culturally-competent-organizations/main.

[71] U.S. Environmental Protection Agency (EPA), "Choose Fish and Shellfish Wisely - 4 - Explore Settings, Channels, and Activities," 06 December 2023. [Online]. Available: https://www.epa.gov/choose-fish-and-shellfish-wisely/4-explore-settings-channels-and-activities.

[72] K. B. J. S. R. Mithra Moezzia, "Using stories, narratives, and storytelling in energy and climate change research," Energy Research and Social Science, vol. 31, pp. 1-10, 2017.

[73] S. Rotmann, ""Once upon a time..." Eliciting energy and behaviour change stories using a fairy tale story spine," Energy Research & Social Science, vol. 31, pp. 303-310, 2017.

[74] T. L. M. T. M. I. G. Stephanie Hankey, Visualizing Information for Advocacy, Tactical Technology Collective, 2014.

Pacific Northwest National Laboratory

902 Battelle Boulevard

P.O. Box 999

Richland, WA 99354

1-888-375-PNNL (7665)

www.pnnl.gov