Pacific Northwest
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# Energy Equity and Environmental Justice Summit Report

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# Executive Summary

On September 28, 2022, Pacific Northwest National Laboratory (PNNL) hosted a limited-engagement Energy Equity and Environmental Justice (EEEJ) Summit with the Department of Energy (DOE) Office of Economic Impact and Diversity (DOE-ED) and DOE national laboratories. The goal of the Summit was for labs to highlight their capabilities in the EEEJ space and connect them to DOE-ED's mission and goals as well as share lessons learned and best practices in various programmatic spaces.

The event commenced with an opening address from Director Shalanda Baker (DOE-ED), which included a call to action for the national labs. Three presentation panels followed, giving insights to national laboratory programs that are currently taking steps to enhance the way science is implemented through equity and justice lenses. A roundtable discussion with Angela Becker-Dippmann (PNNL), Director Shalanda Baker, Dr. Tony Reames, Dr. Anjuli Figueroa, Bari Brooks, and Chris Gunn from DOE-ED concluded the Summit and highlighted lessons learned, gaps, challenges, opportunities, and future needs that will improve the impact and partnership of EEEJ work at DOE, national laboratories, and other programmatic areas. Key Summit actions are provided below.

**Operationalize EEEJ within national labs with more coordinated efforts between the national labs.** There is a lack of cohesive EEEJ activities across the national labs. Labs can individually formalize EEEJ efforts, coordination, and communication, including better integration of EEEJ principles into program planning and assessment activities. Further, many labs offer examples of program coordination across the lab system, yet opportunities remain to better sync EEEJ program and initiative efforts across laboratories. There is an opportunity for a national-laboratory-wide EEEJ community of practice to create more sustainable outcomes and mobilize action for EEEJ.

**Strengthen EEEJ research practices and metrics for better data dissemination.** EEEJ can be better integrated in national labs and industry through research practices, methods, and metrics. Some existing lab models and methodologies do not consider downscaling or integrating of climate and grid models with socioeconomic data, which can create larger disparities and unintended consequences in sought-after equitable outcomes. Labs see an opportunity to create program-level energy justice metrics, including addressing each type of energy justice, across the full research and development life cycle.

**Integrate community engagement at project onset.** To achieve equitable outcomes relative to community engagement, development projects must thoughtfully consider engagement before initiation. Recognition justice is a critical precursor for thoughtful engagement and enhances efforts at project onset. All communities, individuals, and parties involved in the project must be identified and provided a role for decision-making and authority. In this regard, stakeholder access could be improved with co-creation and diversified communication channels.

**Employ co-creation processes.** Labs recognized that co-production of knowledge leads to longer-term success than one-way technical assistance and highlighted the need to change traditional approaches to working with communities. More co-development will help national labs understand communities' histories, cultures, and strengths, and this knowledge will better inform projects that support community goals. Laboratories also have an opportunity to use their position of privilege and power to remove opportunity barriers as they partner with communities. Moreover,

collaboration will better match community challenges and opportunities with national lab efforts and resources and help give communities social ownership and participation in project outcomes. Community expertise and involvement is valuable, especially considering the time commitment involved. Thus, compensating communities as a means to minimize participation barriers and support their involvement was also addressed as an aspect of co-creation.

**Address historical issues of mistrust.** There is a lack of trust in DOE and DOE's outreach and engagement practices that must be overcome. DOE and national laboratories must pivot from historical "one and done" approaches that do not include iterative and sustained engagement. This includes some labs' ties to DOE industrial complexes or projects with an associated history of nonconsensual decision-making. Labs also cited difficulty in establishing trust with communities who have been adversely affected by energy company emissions and breaches of trust. Tribes, states, local governments, communities, and stakeholders need investments to build and sustain relationships. Relationship and trust building allows communities to learn about projects at a pace that works for them and develops assessment tools and engagement processes with community input. Enhancing the current legacy of engagement will need to address procedural and recognition justice through more transparency and accountability. Time plays a major role in trust building and may be a challenge considering national lab project-by-project structure and execution timelines.

**Utilize DOE's help in operationalizing EEEJ.** DOE can help streamline the EEEJ narrative within national labs and assist labs in formalizing EEEJ efforts, coordination, and communication. DOE can offer additional guidance on integrating EEEJ into program planning and assessment efforts. Labs are also concerned about sustaining these efforts across changes in leadership and structure. DOE can incentivize national laboratories to participate in EEEJ work through inclusion requirements in funding calls. Increased communication and explicit expectation setting between DOE-ED and national laboratory leadership will help advance EEEJ policies.

**Reduce redundancy for communities participating in multiple programs.** There is a need to establish national-laboratory-wide community engagement tracking to reduce community request burdens. For instance, some minority-serving institutions (MSIs) are deluged with offers to collaborate, so these institutions focus on high-probability, high-funding efforts. Creating a centralized hub for information about community-based national laboratory research and development will minimize redundancies and help identify gaps and opportunities to better serve communities.

**Simplify and streamline funding opportunities.** Principal investigators at national laboratories are overwhelmed by DOE funding opportunity requirements. There is also a lack of community-based co-principal investigators to help lead projects and better enable a community-specific approach to EEEJ initiatives. Additionally, some historically Black college and university (HBCU) professors have reported limited time to write proposals. DOE can identify alternative funding criteria or mechanisms to account for and improve community readiness for larger investments. National labs are uniquely positioned to help communities align resources for deployment once technical assistance and subsequent development phases have been achieved. National labs can also review engineering requirements that support deployment dollars.

This report covers the opening address, Summit panels, roundtable discussion, and their corresponding question and answer segments. Appendix A lists staff in attendance, and Appendix B contains a full workshop agenda.

# Acknowledgements

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# Acronyms and Abbreviations

| | |
|---|---|
| Argonne | Argonne National Laboratory |
| DAC | disadvantaged community |
| DEIA | diversity, equity, inclusion, and access |
| DOE | Department of Energy |
| DOE-ED | Department of Energy Office of Economic Impact and Diversity |
| DOE-EM | DOE Office of Environmental Management |
| EEEJ | Energy Equity and Environmental Justice |
| EERE | Energy Efficiency and Renewable Energy |
| ERA | Energy Improvements for Rural or Remote Areas |
| FOA | funding opportunity announcement |
| HBCU | historically Black colleges and universities |
| INL | Idaho National Laboratory |
| LLNL | Lawrence Livermore National Laboratory |
| MBE | minority business enterprise |
| MSI | minority-serving institution |
| NREL | National Renewable Energy Laboratory |
| OCED | Office of Clean Energy Demonstrations |
| ORNL | Oak Ridge National Laboratory |
| PNNL | Pacific Northwest National Laboratory |
| RCE | Regulatory Center of Excellence |
| RFI | request for information |
| R&D | research and development |
| SRNL | Savannah River National Laboratory |
| STEM | science, technology, engineering, and mathematics |
| TA | technical assistance |
| TRL | technology readiness level |

# Contents

# 1.0 Opening Address and Call to Action

Director Baker's opening address, entitled "The Agenda for Justice and Equity at DOE," underlined Energy Equity and Environmental Justice's (EEEJ's) current relevance, motivated the extraordinary mission of DOE-ED, and identified the role of national laboratories in this space. The full address and its Q&A are on YouTube.

The current energy system is inequitable. Research supports that the lack of equity is endemic—from Black and Latinx communities being exposed to more environmental pollution than they produce, to higher energy insecurity in low-income and Black households, to lower photovoltaic adoption rates in census tracts for people of color. DOE-ED is addressing these disparities by advising on energy policies, regulations, and other DOE actions related to minorities and minority business enterprises (MBEs) that have historically been at the forefront of energy inequity. A recent highlight of these efforts is the Justice40 Initiative, which directs 40% of the overall benefits of certain federal investments—including investments in clean energy and energy efficiency, clean transit, affordable and sustainable housing, training and workforce development, remediating and reducing legacy pollution, and developing clean water infrastructure—to flow to disadvantaged communities (DACs).

As DOE-ED ensures equity is embedded in all DOE programs and policies, Director Baker highlighted four ways national laboratories can help advance EEEJ. First, national labs can expand the science, technology, engineering, and mathematics (STEM) pipeline and deepen community connections to advance diversity, equity, inclusion, and access (DEIA). The shift to a clean energy future must consider employee transitions from fossil industries and demographic workforce shifts to reflect the communities being served. Communities have expertise that can help close the implementation gap and must be engaged in lab research. Next, national labs are uniquely positioned to incubate and accelerate MBEs in support of decarbonization strategies. All funding opportunities now require DEIA plans in which applicants must detail, for instance, their strategies for community engagement and contracting with diverse parties. National labs can help develop this ecosystem by supporting MBEs in preparing for their larger role in these new opportunities. Third, in research, national labs can partner with and compensate minority serving institutions (MSIs) to build capacity across academic communities and advance diverse approaches to climate and energy research questions. This is a key effort in DOE's Equity Action Plan that will also help build and strengthen the STEM workforce pipeline between DOE, historically Black colleges and universities (HBCUs), and MSIs. Within each lab, research portfolios should advance EEEJ and focus on distributive impacts of technology development and deployment. Lastly, national labs can collect and report DEIA and contracting data to DOE-ED to track progress. Data is essential to validate efforts and continue toward tangible EEEJ impacts.

After the opening address, attendees asked Director Baker the following questions that ranged from DEIA conversations within national labs to Justice40 Initiative goals and measuring outcomes.

**How do you ensure the sustainability of Justice40 across administrations?** Cracking the agency's DNA is a major part of sustainability. This begins with requests for information (RFIs) that must send the right signals to communities. Currently, all RFIs have similar questions on EEEJ and DEIA. Funding opportunity announcements (FOAs) also have a template created by DOE-ED that grades applicants on their community benefit plans. These plans must discuss

stakeholder engagement, Justice40 implementation, DEIA efforts, MBE contracting, and job creation. In FOA review, this plan is 20% of the applicant's final score. Further, DOE-ED is building a team to hire a more diverse workforce at DOE with individuals who have experience in EEEJ.

**How do we get our lab colleagues to talk about justice and DEIA?** DOE-ED is working to force the conversation through the solicitation process. National laboratory leadership should be building DEIA cohorts to share DEIA education. The data is clear that systemic problems fall along racial lines, which reinforces the "why" of justice and DEIA. Representatives of justice and DEIA efforts must learn the language, create space for conversation, and be unafraid to have conversations. And, in having the conversation, they must extend grace and forgiveness without retribution.

**Many people confuse DEIA with EEEJ. Do you have any advice on educating without bearing the brunt of teaching, so that this information can be disseminated downstream?** Lean into the DEIA experts to relieve the burden. Also, use literature, including that from DOE-ED, as tools to teach others. EEEJ is informed by diverse teams and perspectives, but it is separate from justice work in research portfolios. Let professionals in DEIA be the leaders of this area.

**What does it mean for 40% of benefits to go to communities? Are communities going to get funding directly?** There has been debate about whether communities should get 40% of funds or 40% of benefits. New York's Climate Leadership and Protection Act had a similar justice mechanism and had the same debate. The Biden Administration settled on benefits for two reasons. One, spending is not always a positive. DOE would have more trouble with 40% of spending because not all communities want new infrastructure. Two, DOE-ED is focused on how spending flows. Job and business creation are key to this. In addition, DOE-ED wants to measure exposure to environmental hazards and harms, as well as other justice metrics, which is very hard to do solely with dollar investments. Communities' Local Energy Action Program (LEAP) is an example of a prize that did not give money directly to communities, but instead to labs to support communities' visions of energy futures. Through lab support, communities can prepare to apply for significant DOE-ED funding opportunities. The Justice40 Accelerator is also helping community capacity building in a similar fashion. It is imperative to get communities to the front of the line, so they have a seat at the table to apply for funding.

**Much of the research and data needed in this space is sociological, and there are many soft science leaders in attendance. Across departments at DOE, social science is overlooked for hard science. How can we enable more funding for social science work?** The climate crisis is inter- and trans-disciplinary and requires diverse minds to solve. DOE-ED wants to embed interdisciplinary questions into efforts, and this will require diverse teams. DOE-ED needs labs to take leadership in building these disciplinary and demographically diverse teams. Technology dissemination and adoption will require a different skill set than just science and engineering.

**What advice do you have on unintended consequences of clean energy solutions and impact on Indigenous populations?** We must reimagine our research from early-stage R&D to distributive impacts of our work. This also emphasizes why we need disciplinary and demographic diversity on our teams so that we ask the right questions. It will help us structurally embed new perspectives in the research process.

# 2.0 Summit Presentation Panels

Seven national laboratories participated in the EEEJ Summit. One or two representatives from each laboratory delivered an overview of programs, projects, and internal laboratory activities relevant to EEEJ. This section provides a synopsis of the content from those presentations as well as the Q&A that followed.

## 2.1 National Renewable Energy Laboratory

The National Renewable Energy Laboratory (NREL) provided a two-part presentation on their *Vision for a Clean Energy Future for All* (part one) and the *DOE Office of Clean Energy Demonstrations' (OCED) Energy Improvements in Rural or Remote Areas (ERA) Program* (part two). In part one, NREL acknowledged that energy justice has multiple dimensions. These dimensions include DACs that are disenfranchised by social, economic, racial, and health inequities. Caused by policy decisions, these inequities are reflected and manifested in the U.S. energy system.

NREL's energy justice vision involves driving equitable access to the benefits of sustainable energy to accelerate a clean energy future for the world, while also remediating economic and environmental burdens of those historically harmed by the energy system. Presenters focused on one of four facets of this vision—centering equity and energy justice throughout its research, development, deployment, and diffusion practices. This work is occurring through a Laboratory Directed Research and Development (LDRD) funding opportunity, allowing NREL to refocus its efforts to explore practical ways to develop metrics and methods for integrating energy justice from early research through deployment. This early adaptation approach focuses on three key outputs:

- Need-finding survey: Existing practices and barriers when researchers try to apply energy justice to work
- Metrics for applying energy justice to research: Literature review on metrics for late technology readiness levels (TRLs) and new metrics for early TRLs
- Methods for applying energy justice to research: New methods for early TRLs and assessment of NREL case studies.

NREL also discussed the energy justice benefits inherent to energy-centered, geographically appropriate retrofits. Retrofits can reduce energy consumption and improve occupant health and comfort. Barriers to deployment of these retrofits included cost, poor existing conditions, and unique building construction. With DAC deployment, the barriers can be even more exacerbated due to occupancy, program design, cost, and worsening of existing conditions.

Part two highlighted NREL and five other national laboratories working with OCED to shape the new ERA Program. The program leverages a $1 billion allocation from the 2021 Bipartisan Infrastructure Law to improve the resilience, safety, reliability, availability, and environmental performance of energy systems in rural or remote areas with fewer than 10,000 people. The national laboratories are also developing a novel community engagement strategy to engage a diverse range of communities that do not have previous experience participating in federal programs, to conduct technical assistance analysis for novel engagements, and to deploy program design innovations to reduce barriers to entry.

OCED issued a RFI for the ERA Program in October 2022 and is hosting workshops as an opportunity to hear about energy challenges and the types of projects that can improve energy systems in rural or remote areas. Moving forward, NREL is working to:

- Create program-level energy justice metrics, including addressing each type of energy justice, across the full R&D life cycle
- Establish incentives for energy justice lab work through funding calls
- Provide communities with accessible information and best practices to navigate economic development and guide communities through the energy justice process to become deployment-ready
- Identify lab- and community-based participation barriers.

Overall, NREL has partnered with thousands of communities around the United States and internationally through projects such as Clean Energy to Communities, Communities LEAP, the Energy Transitions Initiative Partnership Project (ETIPP), the United States Agency for International Development, the Los Angeles 100% Renewable Energy Study, and the Puerto Rico Grid Resilience and Transition to 100% Renewable Energy.

## 2.2 Savannah River National Laboratory

Savannah River National Laboratory's (SRNL's) *Environmental Justice at Savannah River National Laboratory* presentation discussed an extension of a successful working group in the soil and groundwater fields associated with the Savannah River Site. The expanded working group, the Regulatory Center of Excellence (RCE), extended SRNL's capabilities into the regulatory field to provide technical, regulatory, and stakeholder communication support in critical areas such as soil and groundwater remediation. The RCE supports environmental justice by championing DOE-related efforts via strategic coordination and partnerships with DOE site communities. The Center also incorporates the socioeconomic dimensions of DOE mission activities into its decision-making for any of its environmental justice and energy equity initiatives. Engagement with, and investment in, communities most affected by DOE sites and activities is also a priority. Some examples of RCE support include connecting customers with technical, regulatory, and policy experts, and facilitating open dialog to enable early buy-in and continued engagement between regulators and stakeholders.

Additionally, SRNL is responsible for the daily operations of the DOE Office of Environmental Management's (DOE-EM's) Minority Serving Institutions Partnership Program since 2014, supported by six other national laboratories. The program was designed to address DOE-EM's future workforce needs by partnering with academic, government, and DOE contractor organizations. These partnerships seek to mentor future minority scientists and engineers in the research, development, and deployment of new technologies that address DOE-EM's environmental cleanup challenges.

In addition, through an environmental justice grant, DOE partners with Savannah State University to coordinate annual radiation, energy, and technology workshops. SRNL participates in these workshops, designed to educate teachers so they can educate students, by offering its radiological control expertise.

Lastly, an initiative under the DOE Environmental Justice program is the Citizen Advisory Board to ensure all communities are represented in decisions regarding DOE sites and facilities that could affect them.

As a national laboratory tied to a DOE industrial complex that is responsible for the disposition of nuclear materials, waste management, environmental cleanup, and environmental stewardship, SRNL has an associated history of nonconsensual decision-making to overcome. SRNL is committed to investing in communities that are most affected—past and present—by DOE sites and activities.

## 2.3 Pacific Northwest National Laboratory

Pacific Northwest National Laboratory (PNNL) gave a two-part presentation entitled *Energy Equity and Environmental Justice Capabilities at Pacific Northwest National Laboratory.*

PNNL addresses EEEJ as part of several initiatives and programs. PNNL's Energy Storage for Social Equity program elevates technical assistance for vulnerable communities through energy storage technology and by building capacity in communities to learn about designing, operating, and maintaining energy systems. This program connects energy storage solutions to social outcomes, in addition to linking power system resilience with community resilience.

PNNL also partners with communities through technical assistance via ETIPP (led by NREL and supported by Sandia National Laboratories, Lawrence Berkeley National Laboratory, and regional partner organizations) and is working with NREL and Lawrence Berkeley National Laboratory on developing a new project, the Community Led Innovation Center. Through these programs and partnerships, PNNL is providing support to communities wrestling with energy accessibility and affordability as well as intersections of other vulnerabilities as they work with DOE to make programs more transparent, efficient, and accessible.

There is also the Equity in Grid Planning Project, supported by Sandia National Laboratories, that addresses new objectives to electric grid planning, including decarbonization, resilience, and equity in integrated distribution planning processes.

Researchers at PNNL also conduct interdisciplinary assessments to examine proposed actions' environmental, cultural, socioeconomic, and environmental justice impacts. PNNL capabilities include detailed demographic data summarization from the Census and other sources, as well as economic modeling capabilities. In combination, these capabilities enable identification of underserved or overburdened communities, disproportionate health and environmental impact analysis, and mitigation for the most vulnerable populations that may result from federal actions, environmental hazards (e.g., extreme weather events), or systemic disruptions (e.g., infrastructure failure).

As an example of its practices, PNNL supported the U.S. Nuclear Regulatory Commission (NRC) by reviewing and recommending methods to identify underserved or overburdened populations vulnerable to environmental justice impacts beyond people of color and low-income communities in accordance with Executive Order 13985. PNNL also provided recommendations to enhance the NRC's internal environmental justice assessment approach by recommending consistent guidance, creation of community review panels, better coordination with other agencies, training, and a database of community contacts. PNNL is conducting similar activities with other federal sponsors as well.

PNNL is also actively involved with the DOE Office of Nuclear Energy's (DOE-NE's) consent-based siting approach to site an interim storage facility for the nation's spent nuclear fuel. PNNL is developing programmatic frameworks to integrate stakeholder values and input, setting

programmatic goals and metrics to evaluate success, and developing strategies and frameworks to ensure equitable future siting actions.

Driven by national priorities in clean energy and environmental and energy equity, PNNL also has an LDRD project to develop the Grid Operations, Decarbonization, Environmental and Energy Equity Platform (GODEEEP) to help meet goals in emission reductions, resilience and reliability, and justice and equity. A GODEEEP research objective is to evaluate equity implications of new power grid infrastructure, emissions, electricity prices, reliability, and transportation electrification.

PNNL is working to:

- Achieve equitable outcomes, even when community starting points are different
- Downscale its climate models
- Encourage a process of co-creation for technical assistance programs and related solutions
- Provide more pathways from technical assistance to other programs and deployment opportunities
- Integrate community engagement at the start of siting projects
- Move from transactional to transformational environmental justice
- Leverage more interdisciplinary approaches
- Reduce redundancy for communities participating in multiple programs
- Incorporate more tribal engagement, including consultation, as part of the DOE-NE consent-based siting processes.

## 2.4 Sandia National Laboratories

Sandia National Laboratories (Sandia) delivered a two-part presentation titled *Energy Equity and Environmental Justice Capabilities at Sandia National Laboratories*, which highlighted 30 years of work relative to tribal engagement, as well as social burden analyses and Sandia's rural/remote community engagement effort with OCED.

Sandia has the largest number of American Indian and Alaska Native (AI/AN) staff (200+) out of all the national laboratories. Some of these staff are part of a group of Indigenous subject matter experts who support Sandia's tribal technical assistance (TA) program. This TA program has been in place since 2002 when the DOE Office of Energy Efficiency and Renewable Energy's Tribal Energy program partnered with NREL and Sandia to assist tribes with renewable energy developments. The DOE Office of Indian Energy has also funded TA, technical reviews, and internship programs provided by Sandia since 2005. These programs include:

- Sponsorship for an AI/AN internship program, whose 20-year anniversary is being celebrated in 2022. There have been 47 interns representing 24 different tribes in this program, with 67 percent of them being women.
- Community Strategic Energy Planning (SEP) with subcontractor Indigenous collaborations, including a Native woman-owned business. Eighteen tribes completed the SEP process with documented plans.

Sandia is also responsible for tribal energy storage projects in partnership with the DOE Office of Electricity. There are currently six different projects with five different tribes.

Sandia also works with the DOE National Nuclear Security Administration's Minority Serving Institution Partnership Program supporting tribal colleges and universities (TCUs). This program has hired 14 total TCU interns since 2016.

Sandia also participates in the same OCED ERA Program mentioned in Section 2.1, sharing in the goal to raise awareness and engage communities not previously connected to DOE and to support project pipeline development where DOE takes on project risk. Justice40 metrics and capacity building are also a priority for the ERA team as they analyze procedural justice barriers and coordinate construction projects in new communities.

A unique aspect of Sandia's work is exploring social burden as a metric of resilience and equity. Social burden quantifies how hard society is working to meet its basic needs using effort and ability as variables. This metric can help planners gain quantitative insight into how grid improvements affect communities.

Sandia's lessons learned stem from their many years of successful community and tribal engagement. Internship programs should grow a succession plan of STEM professionals for communities, not just for the national laboratories. Learning what methods work and why, rather than assuming and making decisions for communities, is key for good TA. In this regard, community leadership should not be questioned, and outreach avenues should be diverse (e.g., via radio) and tailored to community preferences.

Sandia's major challenge moving forward will be overcoming the government's legacy of tribal engagement and management. Communities have stories they want to tell, and a key part of improving tribal relations is active listening to build trust and understand challenges. Moreover, enhancing the current legacy of engagement will need to address procedural and recognition justice through more transparency and accountability.

Sandia's major needs and growth opportunities are:

- Opening more formal opportunities for tribal engagement (i.e., more government-to-government interactions)
- Supporting movement toward tribal energy sovereignty
- Refining and validating the methodology to calculate its social burden metric.

## 2.5 Idaho National Laboratory

Idaho National Laboratory (INL) provided a two-part presentation, *Idaho National Laboratory and Environmental Justice.*

INL is developing a lab-wide environmental justice culture. This involves creating programs and projects that exemplify INL's commitment to environmental and energy justice. The long-term goals are to establish an environmental justice team, site council, catalog of environmental justice programs, and environmental justice metrics. As first steps, INL conducted a survey and held a workshop to understand terms people use when describing environmental justice. The workshop received high interest and valuable responses. The most common theme in the

workshop was the need for local tribal engagement and tribal consultation. INL works extensively with the local tribal community and is exploring ways to expand collaboration. In addition, the workshop highlighted the need for including traditional knowledge in environmental justice work.

INL has also surveyed their laboratory to catalog programs relevant to environmental justice and to understand the socioeconomic nature of communities surrounding INL. Next, INL will develop workshops to further define environmental justice at the lab (e.g., the need for more tribal engagement). Developing an environmental justice culture with strong foundations will assist INL in establishing a comprehensive catalog of programs to address EEEJ.

INL's major opportunities and needs are to:

- Integrate environmental justice into program planning
- Create internal and external environmental justice awareness.

## 2.6 Lawrence Livermore National Laboratory

Lawrence Livermore National Laboratory (LLNL) gave a two-part presentation—*Energy, Equity, and Environmental Justice in Carbon Dioxide Removal and Storage* (part one) *and Advanced Manufacturing at Lawrence Livermore National Laboratory* (part two)—spotlighting two capabilities relevant to EEEJ.

The first presentation pertained to the Carbon Initiative. Within this initiative, LLNL is producing the *Roads to Removals* report for DOE, which will include discussions on EEEJ. The EEEJ-related goals for this research are to complete EEEJ trade-off analyses for different carbon dioxide removal methods and to compare with interdisciplinary geographical data. The initiative also supports carbon dioxide removal research at LLNL, including forest management, soil carbon, geologic carbon storage, biomass for carbon dioxide removal and storage, and direct air capture.

The second area of LLNL EEEJ work was advanced manufacturing, which includes a prototyping enclave, and building and manufacturing design questionnaires that address EEEJ concerns in life-cycle analysis. The prototyping enclave's goal is to rapidly close the gap between bench and pilot-scale projects to accelerate technology deployment. Pre-commercial demonstrations in the enclave will show technology feasibility, the potential to scale, and applicability. Academic, national laboratory, and industry partners of all sizes are eligible as applicants to help overcome barriers to rapid scaleup. The enclave's science and technology cross-cutting areas are high-performance computing, advanced characterization, tailored synthesis, data analytics and machine learning, advanced manufacturing, and design optimization.

There is a great opportunity for the enclave to further Justice40 policy priorities and support DOE's Equity Action Plan. The enclave can partner with MBEs to improve clean energy enterprise creation, target interested DACs for project scaleup to increase parity, enable access and adoption of clean energy technology, and host MSIs for research and student training programs.

Looking to the future, LLNL hopes to learn from communities how LLNL's research in carbon management and EEEJ trade-offs can complement and further community goals and interests.

The following challenges were highlighted by LLNL:

- Need for appropriate feedback contacts for project direction
- Guidance on best uses for race-based or socioeconomic indicators in analyses
- Coordination of Carbon Dioxide Removal and Storage initiative efforts across national laboratories
- Insufficient existing funding strategies for including EEEJ analyses into carbon dioxide removal research areas
- Direction on how and where green energies will be deployed in a decarbonized future
- Determination of justice implications for future life-cycle assessment
- Understanding workforce demographic shifts as a result of a clean energy future
- Trainings for transitioning sector employees.

## 2.7 Argonne National Laboratory

Argonne National Laboratory (Argonne) gave a two-part presentation, *Energy Equity and Environmental Justice at Argonne*, that discussed their capabilities to advance energy and economic opportunities, healthy environments, and prosperity for all. Argonne is also evaluating impacts to the human environment and providing mitigation solutions for renewable and fossil energy deployment. Specific focus areas include developing mapping and analysis tools that support EEEJ efforts nationwide, coordinating workshops and training, and equipping the future workforce to address DEIA and EEEJ across the mobility industry.

Within these broader capabilities, Argonne representatives highlighted their work on the EcoCAR EV Challenge and Equity in Mobility Initiative and the Community Research on Climate & Urban Science (CROCUS) program.

The EcoCAR EV Challenge is helping Argonne reimagine new competition to meet DOE objectives. New program funding and structure allows for additional funding ($250k) for each new MSI, $10k yearly in DEIA grants, partnerships between HBCUs and veteran teams, a funded DEIA manager position for all teams, and training to promote an inclusive team environment. This also includes the related technical initiative, Equity in Mobility, which will serve as a model for incorporating EEEJ principles and community engagement into technical components of workforce programs. The goals of this program will include educating EcoCAR students on the importance of mobility equity by reinforcing the importance of inclusive stakeholder-centered design and by equipping students to problem solve with equity, inclusion, and accessibility as a priority. Additionally, there is a goal to enable the EcoCAR program to serve as a nexus for underserved community engagement at universities. This program will fall into two-year "sprints," where years 1–2 engage in community-based challenges focused primarily on community mobility projects (e.g., EV infrastructure and transportation availability/accessibility). Years 3–4 will engage in a design challenge focused on inclusive in-vehicle consumer features (e.g., driver monitoring systems, human–machine interface, user experience, and body interior/exterior feature accessibility).

Over the next five years, the CROCUS program will deliver a reliable representation of the complex urban Chicago metro environment and its feedbacks with climate through a system-based approach for integrating physical, biological, and human dimensions. The developed framework will be used to simulate, evaluate, and project the impacts and feedbacks between climate and urban systems. The Chicago region was chosen for this program because it is an excellent focal point for understanding urban-to-regional climate science and how to implement solutions that are equitable to communities. This team will involve representatives from research and education (e.g., universities and national laboratories), communities, industry, and local government.

Moving forward, Argonne will work to:

- Develop a lab-wide environmental justice effort
- Improve inter-lab coordination and communication
- Include community-based co-principal investigators to help lead projects and better enable a community-specific approach to EEEJ initiatives.

## 2.8 Oak Ridge National Laboratory

Oak Ridge National Laboratory (ORNL) presented *Energy Equity and Environmental Justice at Oak Ridge National Laboratory,* beginning with a mixed history of racial inclusion and exclusion at ORNL and highlighting the need for continued work ensuring inclusion and justice throughout the national laboratory's culture. Several ORNL projects support various aspects of EEEJ, including geospatial tools and analyses, economic analyses, outreach, engagement, and growing a STEM workforce.

ORNL geospatial tools and analyses link to energy justice issues through a consideration of distributive, procedural, and recognition-based justice in energy facility siting and placement. At ORNL, justice issues in energy use are being considered with tools examining low-income housing programs, energy efficiency, solar energy integration, and other areas. ORNL staff also developed a framework for identifying the impacts of climate change (e.g., urban heat islands) on at-risk neighborhoods, with a specific focus on Atlanta.

Economic factors in energy justice are also being considered through various economic analyses at ORNL. For example, ORNL is using market conditions and incentives for biomass utilization in hard-to-decarbonize transportation sectors to increase opportunities for advanced biofuel production in DACs. Another project examines the spatial distribution of bioenergy feedstock and uses the outcomes of combined modeling to identify where potential biomass impacts intersect with DACs.

In terms of outreach and engagement, ORNL has a variety of projects across the lab that seek to support the needs of community-based organizations and stakeholders in climate and energy justice initiatives. This broadly occurs through various stakeholder engagement strategies, co-producing knowledge with advisory committees, and collaboration across national laboratories, federal agencies, and more. In addition, ORNL highlighted efforts to build a diverse and talented STEM workforce. This effort is ongoing through HBCU and MSI faculty research programs, student-centered programs (e.g., JUMP into STEM), and National Consortium for Graduate Degrees for Minorities in Engineering and Science fellowships.

As with other laboratories and research organizations, ORNL's EEEJ efforts can be challenged by the lack of a cohesive lab narrative on EEEJ, difficulties in measuring recognition justice, establishing trust with communities, and MSI burnout from repeated engagement requests.

ORNL's future focus areas include:

- Increase community trust with those who have been adversely affected by energy company emissions and breaches of trust
- Structure MSI engagement to reduce collaboration load
- Provide application assistance to MSIs who do not have the capacity to write FOA proposals.

# 3.0 Roundtable Discussions

Director Baker, Dr. Tony Reames, and Angela Becker-Dippmann closed the Summit by facilitating a roundtable discussion with national laboratory participants. The discussion synthesized the challenges, needs, and lessons learned from the Summit. For the discussion, Director Baker asked attendees to reflect and report on three barriers to their EEEJ work: (1) barriers to collaboration, (2) barriers to research dissemination, and (3) barriers to consolidation of the future agenda.

Barriers to collaboration elicited the largest discussion, specifically on the topics of capacity, technology, compensation, and scope. Summit participants described the lack of capacity to do EEEJ work as a function of the laboratory funding structure and the project-by-project and milestone-driven nature of technology-based program development. Taken together, these factors can result in the inclusion of EEEJ considerations as bolt-on tasks rather than fundamental elements of project and program design. For communities, participants attributed capacity issues to the time and resource limitations of local organizations, especially in cases where communities must balance multiple requests to partner with labs and apply to other funding opportunities. Attendees also described problematic assumptions surrounding community access to the technology required for collaboration. This includes a lack of reliable access to communication technology, such as email and phone, as well as geospatial data that underserved communities can leverage to provide critical context for their needs.

Compensation-related barriers to collaboration focused on the structure of funding opportunities and lack of travel funding for community partners. Attendees cited the difficulty for communities to navigate the structure of FOAs and to contribute through cost share. This prompted consideration of alternate mechanisms to lower investment risks, such as adjusting the cost share formula to account for community engagement and life experience, providing cost share exclusion criteria, developing smaller funding opportunities to improve community readiness for larger investments, and more explicitly connecting TA and deployment funding. Attendees also cited travel funding as essential to community engagement at meetings and workshops, especially when considering the federal trust responsibility to support and engage tribal communities.

The final collaboration barrier identified was the limited focus on STEM in research, development, and engagement. While attendees acknowledged STEM work as critical, they also suggested that a lack of consideration for local arts and culture could stifle opportunities for engagement and creative, place-based solutions. This discussion also prompted consideration for the importance of social science in EEEJ.

The discussion about barriers to research dissemination focused on lab-wide engagement, data needs, and community engagement. Attendees acknowledged a lack of information and understanding related to the ongoing work of other labs, which in turn affected their ability to support communities and champion EEEJ. Attendees further considered the longevity of community data and the institutional infrastructure needed to keep it updated and relevant after a project is completed. Finally, to increase research dissemination, attendees suggested that community organizations and representatives need to be engaged earlier in research and development.

Barriers to consolidation of the future EEEJ agenda was the last roundtable topic for discussion. This discussion largely synthesized preceding discussion and focused on issues of coordination. First, attendees pointed to the competition between federal departments working

on similar projects. Second, attendees acknowledged the need for national laboratory leadership to meaningfully advocate for EEEJ and engage in regular dialog with related DOE partners. Finally, attendees communicated their commitment to continuing EEEJ and requested a national lab practitioners forum to regularly engage, network, and share lessons learned.

**Next Steps**

- Increase internal and external incentives for national laboratory staff to participate in EEEJ
- Establish national-laboratory-wide community engagement tracking to reduce community request burdens
- Increase national laboratory presence at local community events to increase access to/for potential partners
- Diversify communication channels used to communicate opportunities with partners
- Identify alternative funding criteria or mechanisms to account for and improve community readiness for larger investments
- Create a centralized hub for information about community-based national laboratory research and development
- Increase number of community-based principal investigators on projects
- Develop and sustain a national-laboratory-wide community of practice for EEEJ
- Increase communication between national laboratory leadership and DOE-ED.

# 4.0 Conclusion

The Summit provided a day full of engaging discussions highlighting national lab capabilities and thought leadership as participants look forward to integrating and improving methodologies, approaches, and metrics for equitable energy and environmental outcomes for communities. Interest among participants to stay connected and to partner on EEEJ work across labs was emphasized, including a suggestion to establish an intra-laboratory community of practice (COP). Due to the limited representation and a desire to be inclusive, the National Laboratory Directors' Council could be a mechanism to present a COP for future intra-laboratory collective next steps on EEEJ program and project work.

This report will be used for collaboration and coordination across national laboratories, DOE, and other agencies and organizations. Further, the report will inform future discussions at the Energy Efficiency and Renewable Energy (EERE) National Laboratory Energy Equity and Environmental Justice Convening on November 10, 2022. At the Convening, EERE will share their approach to integrating EEEJ principles across the research, development, deployment, and demonstration portfolio with national laboratories and encourage learning between EERE and national lab staff on project-specific approaches and concepts.

# Appendix A Summit Attendees

- Department of Energy Office of Economic Impact and Diversity
  - Shalanda Baker, Director and Secretarial Advisor on Equity, shalanda.baker@hq.doe.gov
  - Dr. Tony Reames, Deputy Director for Energy Justice, tony.reames@hq.doe.gov
  - Dr. Anjuli Jain Figueroa, AAAS Science Technology and Policy Fellow, anjuli.jainfigueroa@hq.doe.gov
  - Christine Gunn, Special Advisor on Grid Innovation and Justice, christine.gunn@hq.doe.gov
  - Bari Brooks, Senior Advisor for Equity, bari.brooks@hq.doe.gov
- Argonne National Laboratory
  - Trevor Crain, Manager, Mobility Research and Education Program, tacrain@anl.gov
  - Emily Zvolanek, Senior GIS Analyst, Environmental Science Division, ezvolanek@anl.gov
- Idaho National Laboratory
  - Dawn D. Davis, Specialist, Environmental Justice; Postdoc, Energy Systems; dawn.davis@inl.gov
  - Marsha McDaniel, Senior Advisor, Economic Development, marsha.mcdaniel@inl.gov
- Lawrence Livermore National Laboratory
  - Kim Mayfield, Research Scientist, Energy and Carbon Management, mayfeild8@llnl.gov
  - Becca Walton, Postdoc, Materials Engineering, walton17@llnl.gov
- National Renewable Energy Laboratory
  - Ardelia Clarke, Modeling Engineer, Commercial Buildings Research, ardelia.clarke@nrel.gov
- Oak Ridge National Laboratory
  - Hope Corsair, Electric Grid Energy Economist, corsairhj@ornl.gov
- Sandia National Laboratories
  - Emily Moog, R&D Science & Engineering, Electrical Engineering, ermoog@sandia.gov
  - Sandra Begay, Researcher, Renewable Energy Development, skbegay@sandia.gov
- Savannah River National Laboratory
  - Stephanie Jacobs, Director, Regulatory Center for Excellence, stephanie.jacobs@srnl.doe.gov
- Pacific Northwest National Laboratory
  - Summit Planning Committee:
    - Angela Becker-Dippmann, Program Development Office Director, Energy and Environment Directorate, angela.becker-dippmann@pnnl.gov

    - Nick DiNunzio, Senior Nuclear Advisor, Risk and Environmental Assessment, nicholas.dinunzio@pnnl.gov
    - Ann Miracle, Group Leader, Risk and Environmental Assessment; Senior Advisor, NEPA; ann.miracle@pnnl.gov
    - Tara O'Neil, Manager, Nuclear Regulatory Programs; Senior Advisor, Environmental Justice, Cultural Resources; tara.oneil@pnnl.gov
    - Nikki Sather, Earth Scientist, Coastal Ecosystems, nichole.sather@pnnl.gov
    - Jen Yoshimura, Project Manager, Energy Justice & Equity, jennifer.yoshimura@pnnl.gov
  - Summit Participants
    - Lara Aston, Team Leader, Renewables Integration; Manager, Environmental Effects of Energy Development Program; lara.aston@pnnl.gov
    - Kevin Duffy, Social Scientist, Environmental Justice, kevin.duffy@pnnl.gov
    - Jason Eisdorfer, Advisor, Energy Policy and Analysis, jason.eisdorfer@pnnl.gov
    - Ennea Fairchild-Grant, Social Scientist, Environmental Justice, ennea.fairchild@pnnl.gov
    - Juliet Homer, Team Leader, Energy Policy and Analysis, juliet.homer@pnnl.gov
    - Ellen Kennedy, Senior Advisor, Cultural Resources, ellen.kennedy@pnnl.gov
    - Ebony Mayhorn, Electrical Engineer, Technology Integration, ebony.mayhorn@pnnl.gov
    - Sharlissa Moore, Advisor, Environmental Justice, sharlissa.moore@pnnl.gov
    - Mark Nutt, Manager, Nuclear Energy Programs, mark.nutt@pnnl.gov
    - Alice Orrell, Energy Analyst, Energy Policy and Economics, alice.orrell@pnnl.gov
    - Kendall Parker, Energy Equity Engineer, kendall.parker@pnnl.gov
    - Adrienne Rackley, Economist, adrienne.rackley@pnnl.gov
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    - Geoffrey Whittle-Walls, Social Scientist, Environmental Justice, geoffrey.whittle-walls@pnnl.gov
    - Katie Wolf, Advisor, Scalable Analytics & Decision Optimization, katherine.wolf@pnnl.gov
    - Tony Peurrung, Deputy Director for Science and Technology, aj.perrung@pnnl.gov
- DOE Pacific Northwest Site Office
  - Ted Pietrok, Acting Manager, ted.pietrok@science.doe.gov
  - Tom McDermott, DOE PNSO Environmental Program Manager, thomas.mcdermott@pnnl.gov

# Appendix B Summit Agenda

Pacific Northwest NATIONAL LABORATORY

Energy Equity and Environmental Justice Summit

*Agenda*

**Wednesday, September 28, 2022**

| TIME | TOPIC | PRESENTER |
|---|---|---|
| 8:00 a.m. | Arrive at PNNL's Discovery Hall<br>850 Horn Rapids Rd.<br>Richland, WA 99354 | |
| 8:00 – 8:45 a.m. | Visitor Check-in | All |
| 8:45 – 9:00 a.m. | PNNL Welcoming Remarks | PNNL |
| 9:00 – 10:00 a.m. | **Address to National Laboratories (Hybrid)**<br>DOE Office of Economic Impact and Diversity (DOE-ED) | Director, Shalanda Baker |
| 10:00 – 11:00 a.m. | **Presentation Panel and Q&A**<br>National Laboratories 1, 2, 3 | NREL, SRNL, PNNL |
| 11:00 – 11:15 a.m. | Break | |
| 11:15 – 12:15 p.m. | **Presentation Panel and Q&A**<br>National Laboratories 4, 5, 6 | SNL, INL, LLNL |
| 12:15 – 1:30 p.m. | Lunch Presentation and Networking: GODEEP | PNNL, All |
| 1:30 – 2:15 p.m. | **Presentation Panel and Q&A**<br>National Laboratories 7, 8 | ANL, ORNL |
| 2:15 – 3:15 p.m. | **Roundtable Discussions**<br>National labs and DOE-ED<br>− Lessons learned<br>− Gaps and challenges<br>− Future needs: partnerships, opportunities, impact | Director, Shalanda Baker, Deputy Director, Tony Reames, National Labs, and Angela Becker-Dippmann |
| 3:15 – 3:30 p.m. | Break | |
| 3:30 – 4:30 p.m. | Closing Remarks and Next Steps | Director, Shalanda Baker, Deputy Director, Tony Reames, and Angela Becker-Dippmann |
| 4:30 – 6:00 p.m. | Networking Social | All |

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