The Southeastern Universities Research Association

Energy Justice Forum

2022 Member Workshop Report

Southeastern Universities Research Association

Energy Justice Forum Report

PROCEEDINGS OF A WORKSHOP

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Energy Justice Forum Report

Executive Summary

On September 30 and October 1, 2022, the Southeastern Universities Research Association (SURA) hosted the Energy Justice Forum. Through the forum, SURA convened experts from academia, government, and the private sector to explore the question, “what is energy justice” from the vantage points of multiple disciplines at their headquarters in Washington, D.C. As the world moves into the future, energy justice is at the nexus of major disciplines: energy transition, climate change, social justice, energy resilience, urban and rural planning, and the importance of community involvement in policy and project planning.

Our goal is to present ideas generated through the Energy Justice Forum Report to serve as a starting point for an energy justice research agenda for SURA member universities. Through the lens of social justice, it addresses energy technologies, the role of data science in energy research, ideas about how to approach the implementation of projects and policies, and the critical role of communication as the common thread for success across disciplines.

As part of the Energy Justice Forum, participants approached energy justice from different angles through four breakout discussion groups, which included leaders from universities, industry, and government:

1. Community Impact and Implementation
2. Cyberinfrastructure and Data Science
3. Energy Research and Development
4. Policy, Legal, and Regulatory

The Southeastern Universities Research Association (SURA) is a consortium of sixty member universities that fosters collaborations which enhance members’ capabilities of undertaking significant, transformative scientific research projects that no single institution can handle independently. The Thomas Jefferson National Accelerator Facility is managed by Jefferson Science Associates, LLC, a wholly-owned subsidiary of SURA, for the U.S. Department of Energy's Office of Science.

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Roles of Universities

- Expanding curriculum of environmental and Earth sciences would have a positive impact on energy justice and future workforce development.
- Universities play an important role educating not just their students, but communities as trusted sources of information and through outreach to students as young as elementary school to spark interest in science.
- Universities play an active role in research and development, in addition to serving as trusted neutral parties in data collection and interpretation. Increased collaboration among universities will grow projects such as energy resilience hubs.
- Building a community among scientists from the many disciplines of energy justice will create space for enhanced collaboration and success.

Roles of Funding Agencies

- Funding at the National Science Foundation through the new research pilot process, which allows one year for researchers to work with communities during the project design phase brings all parties on board.
- Many benefits to energy research and development could come if funding for the U.S. Department of Energy's Established Program to Stimulate Competitive Research (EPSCoR)[1] could be expanded, including future energy justice workforce development.

Roles for Community

- Communication between researchers and communities early in the project design process and using accessible language is critical to success.
- Storytelling is an effective means of communicating with stakeholder groups for research projects and policymaking.
- Researchers getting out into the field to work with communities impacted by their research and project implementation is important.

[1] https://science.osti.gov/bes/epscor

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Community Impact and Implementation

The Community Impact and Implementation session addressed how energy projects are put into practice and their impact. The outcome of projects depends on how those implementing energy justice initiatives effectively communicate with the groups they serve, as well as what considerations are made for how the project will be brought to life. Involving community participants early in the decision-making process was seen to be key to the long-term success of projects, from planning through implementation.

Communicating with Communities

One key aspect of successful community engagement is effective communication. Participants discussed how the ways that projects are presented to impacted parties can largely determine the success or failure of the project. When leaders don't talk to the community in the way the community needs, often projects do not come to fruition. One feature of effective communication is accessible, non-jargon-based language. When community members have access to education about how the technologies work, as well as potential benefits and drawbacks of the project, they will be more likely to support distributed energy projects, such as solar installations. The Department of Energy and Environment of Washington, D.C. runs the Solarize D.C. program[2], a community-based outreach initiative which brings solar power to District residents and provides information on benefits and where interested parties can start.

Sometimes community members may have doubts about their ability to engage with energy topics because they are not familiar with the subject. Therefore, community engagement and education efforts should include thoughtful, proactive, deliberate outreach to help members feel supported and welcome to engage. Training is also needed for those implementing policies on how individuals in the group would describe themselves (for example, no one would refer to themselves as "disadvantaged"), in addition to knowing what language might be charged by region, race, and culture. Community-oriented action groups, such as the Center for Energy Education, can serve as a nexus, providing education to policy makers, community members, teachers, and students.[3]

Effective communication requires a two-way discussion between organizers and the community. One way of doing this is through storytelling, which should consider the experience of the people who would be impacted by the project. Story-based discussion is an accessible way of expanding community understanding and allowing community members to share their knowledge and experience. This style of communication should extend to conferences where community members may feel "put in a room to the side." Event organizers could try to include them in the general conference program as participants and panelists.

[2] https://doee.dc.gov/service/solar-initiatives
[3] https://center4ee.org/educational-programs/

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For greater community involvement to take place and the storytelling mechanism to be successful, consideration should be given to how decision-making events are advertised. What time of day and on which days of the week events are held factor into community involvement. The organizer of these meetings should consider what would work for the townspeople. Finally, within the conversation at a town hall, all aspects of policy implementation should be shared with community members. Practically, this would mean discussing how an energy justice-related issue might impact citizens economically or socially, rather than simply relaying the purpose and details of the policy. In facilitating community involvement, communication and consideration are important for policy makers to put into practice. This will help citizens understand projects and their effect on the neighborhood, as well as building trust.

Communication with communities is important at all phases of the project, from inception through design and implementation. By involving the community early, speaking their language, and proactively including them, projects will gain meaning and acceptance.

Implementing in Partnership with Communities

Effectively implementing a project within a local community begins with how energy research is conducted. The process of co-creating the project's metrics is key to its success. It is important for researchers to consider how projects will be implemented. Are they being designed in a way that will work with the community, work for the community, or do work to the community? Indicators of which of these paths a project takes are often community knowledge and will become known to the researchers as they engage with the community.

When considering how to make these changes at the federal level, attention should be given to the person reviewing the proposal and the program officer. These two positions have outside impact on grants, as the proposal reviewer is responsible for selecting which grant proposals are funded, while the program officer shapes how grants are implemented by determining which components of the solicitation are filled.

The National Science Foundation (NSF) is piloting a new process[4] that supports efforts to implement grants in partnership with communities by allowing grant recipients a year to work with stakeholders to design how funded projects will be implemented. Designing projects in this way demystifies the process for communities and helps researchers get out into the community on a more regular basis. This creates the potential for developing deeper relationships between grant recipients and community stakeholders. This approach also results in a cycle of positive reinforcement that includes higher community engagement during the development process, as well as increased contact between researchers and the communities they serve.

As projects are conceptualized, the unique challenges of marginalized communities should be considered. For example, the challenges faced in rural areas might be more extreme

[4] https://new.nsf.gov/funding/opportunities/civic-innovation-challenge-civic

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than in other localities. In order for efforts in this sector to be meaningful, they must consider past policy and actions that continue to impact available resources today, who has power, ways of living, and culture. Some of these include the continuing impacts of segregation and redlining, a discriminatory financial practice based on ZIP codes. Driving factors will be different for community members than for those funding and building projects. Consideration of what is valued within the community and tying some aspects of the project during the design phase to it, in addition to communicating these relationships effectively, could ease adoption of the project by the people living where it will be built.

Early engagement and effective communication between researchers and communities are key factors when rolling out new energy solutions. Storytelling, inclusive language, participation throughout project development, and consideration of people's experiences will all contribute to the future success of energy projects.

Main Points

Communicating with Communities

- Coalition-building is critical to creating projects that have meaningful impact.
- It is important to be aware of what form engagement with the community takes: are efforts flowing with, for, or to the community?
- Terms, questions, and assessments can be interpreted differently by the target community, researchers, and those implementing projects. Interpretations can also vary by region and culture.

Implementing in Partnership with Communities

- Driving factors will be different for community members than for those funding and building projects.
- It is important to consider past policies that affect the present, such as segregation and redlining.

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Recommendations

Language Matters

- Consider regional context and community knowledge when choosing language and creating communication.
- Develop outreach using a storytelling format.

Past Doesn't Have to be Prologue

- Consider past lack of investment in communities due to redlining practices when planning future projects.

Out of the Lab, Into the Field

- Create a forum where researchers and innovators can spend time in communities gaining knowledge from those marginalized in past energy transitions. This is particularly important for rural projects, as many researchers are based in urban areas. The new grant process at the National Science Foundation would be particularly helpful executing this in specific projects.
- Encourage expansion of new National Science Foundation (NSF) grant process that allows grantees time to work with communities during the project design phase to other government funding agencies.
- Build travel to communities into project budget so researchers and project planners can gain understanding of unique opportunities and challenges.

University-Community Partnership

- Create a university-community partnership project to solve a local problem or create a local solution, save money, and/or elevate a community through a new process that lowers energy consumption.
- Consider as phase II of the [above] project: measure money that will be saved by the new process and propose that local government puts savings toward an additional [tangible] community enhancement, such as adding Wi-Fi, new basketballs, or a playground to a community center, making an additional visible, community-building benefit.
- Create economic opportunities that align with climate change solutions and also benefit local communities, including clean energy, such as solar and wind. Include workforce development training for full-circle community uplift.

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Cyberinfrastructure and Data Science

From data collection and privacy to bolstering power grids nationwide to withstand cyber-attacks and natural disasters, cyberinfrastructure and data science play an integral role in the security of individuals, communities, and our nation. Understanding these factors, as well as the many ways in which universities can contribute to positive solutions, is key to building more resilient power systems and ushering in the integration of clean energy sources.

Data science can provide insight into patterns across communities. With a larger amount of data available about a higher number of communities, areas facing similar challenges can be identified, which increases the potential to implement similar solutions across multiple towns and cities. In this way, data science could impact greater implementation of projects that incorporate energy justice across the nation. Sensitivity around data collection and privacy as research related to energy justice is conducted is another key way that data science is related to the field of energy justice. Cyberinfrastructure plays a direct role in energy justice as increased security is integrated as new energy systems are constructed.

Three main avenues emerged from the discussion of cyberinfrastructure and data science: the impact of data gaps on development, data security, and implementing the energy transition.

Impact of Data Gaps on Development

Existing Conditions and Past Policy

For energy justice efforts to be successful, data is needed on factors that impact existing energy conditions in communities, such as energy use patterns and access to energy resources. Areas impacted by the current energy infrastructure, including air quality conditions and community health outcomes could be considered when planning for future energy installations. Part of this data collection process should include acknowledging past and current policies that drive community conditions such as air quality and community health outcomes. When analyzing these data sets, it's important to include redlining, a policy that co-located communities with industrial sites, restricted access to resources, and allowed for a lack of investment[5].

Energy Transition and Job Creation

Filling gaps in data on the economic impact of distributed energy resources (DER) can assist in persuading local decision makers of the need to transition away from carbon-intensive energy resources. Data on potential job creation can be found through the Bureau of Labor Statistics[6]. Participants noted that gaps exist in this data, as it collected by surveys and may not provide a full picture of jobs created by newer energy technologies or jobs lost in the energy transition. In addition to more detailed national data collection, efforts could be made to increase the availability of local economic data, such as energy

[5] https://www.law.cornell.edu/wex/redlining
[6] https://www.bls.gov/opub/ted/2001/may/wk2/art02.htm

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rate payment structures and the resulting burden on communities. Efforts to address this could look at the system cost of using new and emerging renewable energy sources on a long-term basis, as the study conducted by the Massachusetts Institute of Technology and Princeton University did.[7, 8]

Data Collection and Cleaning

The data collection process could include consideration of best practices on metric creation and data cleaning. To ensure that collected data is measured in a meaningful way, metrics should be co-created with community stakeholders and those who are directly impacted by the energy transition. These criteria should be developed during the planning stage of the project and consist of measurable components. Consideration of best practices could include a review of existing practices, including how to visualize data for storytelling. For consistency, these efforts could be taken with newly collected and existing data.

Data Security

Data Collection

It is important to consider data privacy when collecting information in order to respect the individuals whose data is being gathered. Each of the following modes of data collection: mobile phones, land lines, the internet, or the digitization of existing data, presents its own data security challenges. In spite of their differences, there are some baseline measures that can be taken, such as randomizing data to prevent individual identification. This includes data encryption and the removal of personal identification markers. To meet these data security needs, large scale computation, such as that done by data centers, will be required. In addition to physical data security considerations, which information is planned to be collected should be shared with the general public and government agencies. Awareness on the part of data collection agencies on how this impacts the security of data is also critical.

Rural Cyberinfrastructure

As the push for large scale data collection to inform energy justice efforts is made, another area that is important to consider is the availability of cyberinfrastructure in rural communities, particularly areas that have high levels of poverty as defined by the federal government[9]. The lack of resources, combined with the small size and spread-out nature of the communities may restrict their ability to participate in the data collection process[10], limit the forms of data available, and present unique challenges to data security. A solution must be found to address these differences because omitting rural populations could further energy inequality. Special provisions for staggered energy transition goals could be

[7] "Powering the energy transition with better storage" by Leda Zimmerman https://energy.mit.edu/news/powering-the-energy-transition-with-better-storage/

[8] Sepulveda, Nestor et al. 2021. "The design space for long-duration energy storage in decarbonized power systems" Nature Energy 6. 505 – 516 https://doi.org/10.1038/s41560-021-00796-8

[9] https://www.ers.usda.gov/topics/rural-economy-population/rural-poverty-well-being/

[10] https://www.ers.usda.gov/amber-waves/2021/august/rural-poverty-has-distinct-regional-and-racial-patterns/

included in energy laws and policies so these regions are not omitted due to the comparatively small impact they have on the percentage of renewable energy used. In order to have a just transition, the most efficient forms of energy should be considered from the perspectives of fiscal responsibility, complexity, and health outcomes. In rural communities, this may mean extended use of fossil fuels as the nation transitions to a low or carbon-free energy stance.

Implementing the Energy Transition

Interdisciplinary Research

To enable the energy transition in marginalized communities, researchers across academic disciplines will need to collaborate. Combining the understanding of experts in the social sciences with technical and data researchers can create energy systems that allow for better community engagement. To increase the capacity of future researchers to work in this much needed interdisciplinary way, undergraduates could be required to take courses in sociology. Efforts to support needed research and student education could be funded by the Established Program to Stimulate Competitive Research (EPSCoR). The purpose of this Department of Energy (DOE) program is to help eligible states conduct competitive, energy-related research.[11]

Intermittent Nature of Renewable Resources

Renewable energy resources provide many benefits to the community, including reduced carbon emissions. Renewables in some applications can now produce energy less expensively than traditional energy sources. Unfortunately, the most common, PV and wind renewable resources are only available periodically. Part of the energy transition includes addressing the variable nature of renewables to prevent stress on local communities due to irregular availability of power and the high-cost of short-term power sources. Each renewable has its own cadence of availability that needs to be solved. Wind turbines only work at certain wind speeds. Solar power can only be generated on days with little cloud cover. Collocation of different energy sources is one solution that could provide continuous energy. When designing a collocation solution, consideration could be given to how energy resources could complement one another. A strong example of renewable "teamwork" is a combination of wind turbines and solar panels. Solar panels produce during the day, whereas wind turbines have their highest production at night.

Grid Infrastructure and Hardening

Changes to the forms of energy on the grid and more distributed energy production locations may require changes to grid infrastructure, as well as hardening of the grid. When planning for hardening of the grid, consideration for potential cyberattacks and the impact of natural disasters should be included. In order to select appropriate grid infrastructure policies and procedures, the ways renewable energy sources interconnect with the grid need to be standardized. As these changes are being made, ways that utility companies, independent system operators, and regional transmission organizations can be included should be discussed.

[11] https://science.osti.gov/bes/epscor

Conclusion

Effective cybersecurity and infrastructure updates to energy grids across the country and integration of renewable resources, such as solar and wind, will depend on the quality of data collected, methods of data collection, and strength of the research available to inform policies and laws that are created based on the data collected.

Main Points

Existing Conditions and Past Policy

- For energy justice efforts to be successful, data is needed on factors that impact existing energy conditions in communities.

Energy Transition and Job Creation

- Filling gaps in data on the economic impact of distributed energy resources can assist in persuading local decision makers of the need to transition away from carbon-intensive energy resources.

Data Security

- It is important to consider data privacy when collecting information.

Interdisciplinary Research for Energy Transition

- To enable the energy transition in marginalized communities, researchers across academic disciplines will need to collaborate.

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Recommendations

Create Metrics with Community Input

- The data collection process could include consideration of best practices on metric creation and data cleaning. To ensure that collected data is measured in a meaningful way, metrics could be co-created with community stakeholders and those who are directly impacted by the energy transition.
- Include input from a community that will be impacted by policies as laws are drafted to regulate what companies can do with data. *The idea of community input during project and policy planning was independently proposed by all breakout groups.*

Role of Universities in the Energy Transition

- Universities could review potential technologies for installation in communities. Part of the review process could be a review of jobs lost and gained, as well as training that will be needed for jobs supporting the new technologies.
- Universities could conduct data analysis due to their potential to be a neutral third party. To increase equity, MSI universities could be included.
- Include consideration of social equity and environmental cost in decision making. This process could include a social science perspective.

Engage and Communicate

- Promote engagement between utility providers and communities where large-scale implementation will happen by communicating about and holding meetings at times when community members could attend. In addition to required rate structure announcements, this engagement could include discussion of what will be installed.

Training and Transition

- Create training programs specific to energy transitions in areas with low population density and limited broadband access.
    - Set aside funding in state and federal legislation, working toward percentage goals to ensure rural communities are not left behind in transition due to their limited impact on overall transitions.
    - Promote partnership between rural and urban institutions to support the energy transition.

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Energy Research & Development

The Energy Research and Development group explored how to integrate energy justice into the fabric of R&D. Discussions ranged from building bridges and relationships among researchers across the many disciplines that touch energy justice to bridging the divide not only between universities and communities, but also between rural and urban areas. Ideas were put forward about energy justice research at universities, the intersection of research and community, how to address urban and rural solutions through training initiatives. Further discussion about how curriculum expansion, particularly in environmental science and vocational training, when supported by universities and policymakers, could fit into the greater picture of working toward energy justice. Additionally, these experts explored and made recommendations about how changes to funding could have a positive effect on future research and development for energy advancement and deployment.

Energy Justice Research at Universities

As part of this discussion, one of the key questions asked was, “What do you think about energy justice in the context of energy research and development?” One approach to this question is the energy justice component being introduced into curriculum and discussion by the professoriate. One professor noted making an effort to bridge the energy justice conversation to other programs. Building bridges could also be done by having university researchers survey the communities they are studying and for whom they are looking at potential solutions. Another approach is to encourage thinking about the systems in a larger context. Something that could allow for more interdisciplinary integration in energy research and development would be allowing longer timeframes for faculty to complete proposals.

In order to build bridges, the idea of creating an opt-in database of energy researchers’ names, institutions, and expertise was proposed. Researchers in related fields, such as social science, urban planning, project management, and more could be included so that when an interdisciplinary team is being built, the database would serve as a searchable starting point to support bridge-building. Minority-Serving Institutions could be identified to facilitate outreach for collaboration on projects. Relationships and community-building among research scientists, as well as inter-institution dialogue could be furthered through on-line and in-person events.

The Intersection of Research and Community

One example of the intersection of research and community is a question about the future workforce that came up while developing a proposal. The response was that the university was educating graduate students, but that further, the need for education about energy alternatives, one example being energy beyond coal, was not limited to students. The team observed that there was a need to get to elementary schools, and out into the community at large and felt that the university needed to deliver the message that “there is life after

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coal." Educating the local communities where the universities are located about possible future paths and energy alternatives is part of the overall picture of energy justice. Communicating and educating to bring local citizens and future job seekers along for the journey, providing information so they can develop informed opinions about how clean energy solutions could impact and be implemented within their localities is a role universities, as experts, are well-positioned to play. Winning hearts and minds through education and community outreach is an important factor in the transition to clean energy.

The point was also made that when a university, organization, or local government brings a scientist in to talk about technology, project planning for the city, or an environmental topic, people will listen and that the scientist has credibility as an expert. In looking at the intersection of research and the community, a lot of education needs to be done in this area that goes beyond the university into the locality, state, and region. As respected experts, scientists have a critical role to play in educating both at and beyond their institutions.

Rural & Urban

A common theme that came up independently in each of the breakout discussions was finding ways to get scientists into communities by going on-site. In the energy research and development conversation, there was great interest in finding ways to start incorporating technology and community. Part of this means identifying paths to get another community, the scientific community, engaged in local technology deployments.

Community Solar

One such technology installation in rural areas is the creation of solar farms, which are receiving pushback from residents in some places. This is part of a greater discussion on land use. Participants brought up the question, "Who owns the space?" In West Virginia, large corporations own considerable land. The land ownership issue in rural America is similar to building ownership in urban settings, where the question is, "What's in it for them so that they will want to switch to solar?" Education and community partnerships could allow for greater understanding and acceptance from residents.

Methods through which community solar has been implemented in Washington, D.C. could serve as potential models for other urban areas. Community solar energy can be produced anywhere in the District of Columbia[12]. The utility companies pay producers energy credits. Producers can direct the utility company to give their credit to the building of their choice. Credits from energy produced anywhere could be credited to lower other buildings' utility bills. In rural areas that have community solar, they can use it themselves. Distribution of energy and energy credits across buildings and throughout a community network potentially allows for redistribution of resources and benefits, which could contribute to a broader range of beneficiaries from clean energy installations, thus moving the needle on energy justice at large.

[12] https://doee.dc.gov/service/solar-initiatives

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Expanding Curriculum Development

Energy justice is heavily dependent on the product of academic systems. From elementary to the graduate level, an understanding of environmental sciences is what drives progress in this study area. However, in a field that continues to gain attention, more opportunities are needed for people to develop understanding of environmental science. Currently, the inclusion of environmental sciences in curriculum is not federally mandated, which lowers understanding of its importance.

Two ways to address this would be for more schools to create environmental science programs and to consider making them required curriculum. A truly interdisciplinary major, environmental science requires a variety of expertise to address issues in the field. Mandating environmental science courses at an early stage in education could create understanding of the intersection between environmental science and other major fields. If more citizens had this basis of understanding, it would impact the realm of energy justice because communities could better understand their roles as consumers of energy and make educated decisions about their relationship with energy.

Additionally, incorporating Earth science into curriculum for students at an earlier age could positively impact the level of professional interest in the field. During this discussion at the Energy Justice Forum, it was noted that although there are cases where courses are available at the high school level, roughly eighty percent (80%) of environmental science courses are not taught by teachers with a background in that field. Thus, attention must be given to the entire educational system when seeking to address this. On a collegiate level, students in Earth science classes at Howard University attributed their decision to personal interest provoked by world news or social causes rather than from an earlier class. Others attributed their reasoning to community programs that provided them with environmental science experiences.

In comparison to other college majors, environmental science is small and underdeveloped at the university level. Increased support for this field in higher education, as well as collaboration among universities, could improve the level of professional interest in the field. One idea that could help would be for universities to create a collaborative environmental science working group to share resources and ideas about the emerging field of energy justice. Growing the pipeline of future environmental scientists and increasing interdisciplinary academic engagement with this field would help to advance energy justice.

Training & Workforce Development

The sub-topic of solar energy was a focus of discussion. In examining what it means to build a profession in solar energy and what could be done to improve that path, questions arose surrounding what having a career in energy justice requires in our society.

One valuable question that emerged was, “should college be seen as the only legitimate course of study?” Solar companies are lacking a hiring pool of individuals with the skills

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necessary to install solar panels. The conversation noted that the United States was once the world's standard for engineering, but now we often outsource to other countries. One participant commented on how their organization has taught people the skills to install solar panels but struggles to find opportunities to get them into the field. The perceived value of vocational skills has decreased over time, and perhaps began when governments removed vocational training from schools. Companies tend to look solely to educational institutions for recruitment. This devalues the skills of people who received their training from an institution that is not academic. Energy justice requires a variety of professions and skills, including vocational skills. Companies that continue to look solely to academic institutions for recruitment are not recognizing the value of vocational training.

In rural areas, a key consideration is training on the installation and maintenance of renewable energy. The U.S. Department of Energy estimated that in 2022, solar and wind were expected to add more than 60% of the utility-scale generating capacity to the U.S. power grid with 46% coming from solar, compared to 17% originating from wind.[13] As renewable energy projects are constructed, people who live near these projects have the burden of the energy cost. A role universities could play in partnership with local government leaders could be to create workforce development training initiatives so that projects benefit the community economically in terms of lifting up households in addition to larger-scale, community-wide energy benefits, corporate profits, and tax dollars. Training programs could impact energy justice by providing a path for personal economic opportunities, which could create additional reasons for people to remain in local areas long-term. This potential growth could help to build buy-in on clean energy projects from impacted communities, which was identified across discussion groups as a key component in successful project implementation.

Community Buy-in & Representation

In addition to neighbors of clean energy installations seeing and embracing the benefits of training and job creation, "peer pressure" plays a role in influencing thinking. For example, when your neighbor gets electricity, you will want it, too. In urban areas, the main question is "will communities that need it the most get it first?" Utility commissions are appointed by the government. Washington, D.C. has Advisory Neighborhood Commissioners (ANCs)[14], locally elected representatives who serve two-year terms and represent a few thousand residents each. One board seat in various community organizations and at the utility commissions could be reserved for the Advisory Neighborhood Commissioner, or another elected (not appointed) representative, who could serve as a liaison.

Funding & Solutions

Participants agreed that clean energy is needed sooner rather than later. The perspective from a university in a rural area was that energy solutions need to benefit the state where the university is located and that everybody needs to be helped. Part of the mission of the

[13] https://www.energy.gov/eere/renewable-energy
[14] https://anc.dc.gov

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university is to serve their state. There was also interest in creating a solution that has national relevance. As a research university, they felt the perspective from their geographical location would be an important part of the solution. A lot of funding tends to flow to population-dense urban areas. It was noted that there is inertia in the system, whereby the same places get the dollars. What could be done to change that inertia? Furthermore, would the change be good or bad? The group noted it would be neither, just different.

A second solution for funding energy research and development called for additional funding of the U.S. Department of Energy's Established Program to Stimulate Competitive Research (EPSCoR) [15], whose mission is "to enhance the research competitiveness of targeted jurisdictions (state, territory or commonwealth) by strengthening science, technology, engineering and mathematics (STEM) capacity and capability through a diverse portfolio of investments from talent development to local infrastructure." [16] Through this program, jurisdictions are recognized contributors to national and global STEM research. EPSCoR is part of NSF's Broadening Participation [in STEM] portfolio[17]. The group noted that a large portion of research and development is in STEM. For participants focused on underrepresented communities, amplifying STEM education was suggested as a means of integrating energy justice into research and development.

Conclusion

By examining energy research and development from an interdisciplinary approach, participants emphasized the need for researchers from the fields that relate to energy justice to connect professionally and to know each other. Relationships between universities and communities, as well as results of technology projects can be strengthened as funding grows, allowing researchers to work in the field rather than in the lab. Future workforce development through the expansion of environmental science curriculum and vocational training could be supported by educational systems through curriculum development, federal programs through fund allocation, and decision makers through policy creation. Finally, expanding funding for programs such as EPSCoR will have a positive effect on future energy research, development, and deployment, as well as allowing for the integration energy justice throughout all stages of project design and execution.

[15] https://science.osti.gov/bes/epscor
[16] https://beta.nsf.gov/funding/initiatives/epscor
[17] https://beta.nsf.gov/funding/initiatives/broadening-participation

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Main Points

Energy Justice Research at Universities

- One way to introduce the energy justice component into university curriculum is for professors to build bridges to related disciplines.
- Participants were interested in how to start incorporating technology and community. Creating an opt-in database of energy justice researchers would help.

The Intersection of Research and Community

- Reaching communities beyond the university to engage students at younger ages is an important factor in building a future workforce pipeline as part of the transition to clean energy.
- There is a big gap between the lab and the community. Participants see the need to connect these two areas.
- It's important to find ways to get the scientific community engaged in deployments of clean energy technology. One way is to get researchers and stakeholders on site.

Expanding Curriculum Development

- The education system needs more opportunities to help students foster an interest in environmental science.
- Environmental science courses could be made requisite across disciplines.
- A greater understanding of environmental science could increase civic understanding and professional development within the field.

Training & Workforce Development

- Consider the value of trade schools.
- Organizations have skilled people but need a way to get these people into the field.
- There could be one dedicated (elected, not appointed) seat to represent the community on the Utility Commissions Board.

Rural & Urban

- Building bridges among organizations and finding groups with long-term community engagement are key to project success. It's good if the engagement continues beyond the end of the project timeline.
- Reverse fellowship: Researchers could come to the community and get a local experience-based perspective on what the community impact might be.

Community Solar

- Motivating landowners in rural communities and building owners in urban communities to install solar, where the benefits and energy credits can be shared, is a key part of getting solar technology adopted.

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Funding & Solutions

- Much funding tends to flow to urban areas. Funding is needed for rural areas, so they are included in the energy transition.
- Funding for the EPSCoR program could be expanded.
- Project-specific funding, not just outreach, needs to go beyond institutions and reach communities.

Recommendations

Interdisciplinary Data Base

- Create an opt-in database of energy researchers' names, institutions, and expertise. Minority-Serving Institutions could be identified.

Out of the Lab, Into the Field

- Create reverse fellowships that would allow researchers to come to the community and get a local perspective on what community impact might be.

Community Liaison Representation

- A seat on the Board of the Utility Commission could be reserved for an elected (not appointed) community liaison representative.

Funding & Solutions

- Pursue funding for researchers to go on site to communities that are the focus of projects and local technology deployments. *This recommendation was put forth independently by multiple breakout groups.*
- Grow funding for the Department of Energy's EPSCoR [18]program, which will increase funding for STEM research, allowing energy justice to be integrated into energy research projects.
- Increase funding for specific projects, not just outreach, that goes beyond institutions and reaches communities, for example: finding groups that have long-term community engagement.
- Change current inertia in the system to get more energy transition funding to flow to less population-dense rural areas.
- Increase funding for social scientists to be included in technology deployment projects to facilitate communication with communities and offer a holistic approach while a researcher from another scientific or engineering discipline is leading the project.

[18] https://science.osti.gov/bes/epscor

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Policy, Legal, and Regulatory

The Policy, Legal, and Regulatory breakout group applied their backgrounds in academia, government, law, and research to focus on improving the role of policy in addressing energy justice issues. By critiquing and offering realistic adjustments to systems that are currently in place, participants sought to shine light on issues overlooked by current policy. Ideas were put forth in three major areas: facilitating community involvement, resilience, and implementation.

Facilitating Community Involvement

Historically, marginalized communities impacted by the implementation of policies are often excluded from the decision-making process[19]. This results in policies that do not benefit them. It was noted in the policy discussion that there is a disconnect between where resources are needed versus where they are being directed, and that community involvement in policy initiatives should be approached holistically. Thus, the party physically impacted by the installation of solar panels, the renter, does not receive the benefits of policy supporting its installation. Excluding renters from these incentives is an example of how members of communities who have been most impacted by the effects of energy transitions are largely excluded from policies. One way to address this is for political leaders to involve community members early and continuously throughout the policy-making process.

The common thread of this discussion was the importance of empathizing with the reality of the target audience when seeking the involvement of community members in political processes. The current systems for communities to engage with the decision-making process can be improved by presenting energy justice issues in ways that are digestible for the average person. A mechanism to achieve this is “telling the story,” where policy is conveyed by storytelling, a communication technique that came up independently in the *Community Impact and Implementation* discussion. This shifts the focus from a detailed discussion of the project and legislative components to an understanding of the real-life positive and negative impacts of the policy on communities.

Resilience

Certain themes throughout justice work will continue to deserve ample consideration. Particularly, the theme of resilience merits attention. Resilience generally means “the ability to recover quickly from difficulties.” The difficulties vary greatly depending on the field of interest. *What does it mean to be resilient in the realm of energy justice?* The

[19] https://www.whitehouse.gov/wp-content/uploads/2022/04/DOE-EO13985-equity-summary.pdf

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following methods were considered to answer that question: resilience research, energy resilience hubs, and reshaping.

First, there must be a structured process for understanding what and how resilience should be measured. Thus, support for resilience research specifically within energy justice is necessary. This research would allow for various forms of data feedback to direct policy makers and leaders on how to address energy justice in their communities.

Next, the idea that resources and benefits are flowing to the parties most affected could be addressed through the establishment of energy resilience hubs. The purpose of these hubs would be to have a community-based, community-focused process to address daily vulnerabilities, mitigate disruption, and recover from difficulties in the community. Support of energy resilience hubs would help to increase community engagement at the legislative level.

Lastly, “reshaping” is a broad term used to characterize a re-programming of the current methods in place to produce a more desirable outcome. Reshaping focuses on community goals such as increasing environmental literacy or growing civic participation. Goals would be agreed upon at civic meetings and presented as recommendations in order to increase support for their adoption.

Approaching energy justice resilience through these three practices makes progress toward defining what resilience means within the field of energy justice. Used in concert, these three methods form solid footing for building energy justice resilience into practice within communities throughout the United States and the world.

Implementation

In the topics discussed thus far, issues in current systems as well as realistic solutions have been presented. For these recommendations to have impact, practical methods of implementation are needed. *Community Involvement* addressed the idea of “telling the story” of policy initiatives. The idea to grow energy resilience hubs was offered in the *Resilience* section. *Expanding Curriculum Development* recommended including environmental science courses in secondary school, as well as support for growing this field at the collegiate level. *Workforce Development* put forth the goal of increasing the professional value of trade school training.

The forum offered three methods to implement recommendations successfully. First, it is recommended that budget is allocated for the “pre-implementation phase” of project planning. This would allow for research to be conducted within areas that would be impacted by the recommendations made above. The goal of this research would be to collect information about where and how to engage most effectively with the target group to create a custom implementation plan. This information could be collected via community members or accessed from data/research institutions.

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Second, stakeholder meetings are seen as the most practical means for local leaders to engage with policy makers. Policies can be created to improve specific concerns from the community. These meetings should open a line of two-way communication. Lastly, the forum recognizes the role of policy in energy justice. The focus should not be on implementing justice through policy, but rather on implementing policies that serve communities.

Conclusion

Multiple themes flowed throughout the Policy, Legal and Regulatory discussion, from how to facilitate community involvement and grow environmental science curriculum, to building resilience and the workforce of the future. This group asked big questions that encouraged the establishment of guiding principles. Discussing the question “What should the criteria be for determining who needs help?” led to the conclusion that work should focus not only on whatever is going to help the most people, but also on what will help the people who need it most. Finally, participants asked, “Are there people who will just do the right thing?” The forum discussed in detail what methods will improve the chances of parties choosing the “just” option. Effective policymaking and implementation will support energy resilience, future workforce development, and involve community members in project and policy planning.

Main Points

Community Involvement

- Find the most compelling ways to tell a story and drive change.
- Build community power through civic participation.

Resilience

- Communities that need the rebalancing that energy justice would bring also need policies that put resilience and recovery mechanisms in place to help them recover from energy disruptions, such as natural disasters.
- Resilience research, energy resilience hubs, and reshaping are methods that could be formalized in policies that lift up communities.

Implementation

- Research could be used as a tool to serve communities.
- The system should not just help the most people, but help the people in most need.
- Focus should be on implementing policy that is just rather than trying to implement justice through policy.

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Recommendations

Community Research

- Local governments could be awarded/allocate budget to invest in research methods that will inform policy of community dynamics, including funding for community participation, stakeholder meetings, and the pre-implementation phase of project planning. *This recommendation was also made independently by the Community Impact & Implementation breakout group.*

Vocational Training Value

- Solar companies could be incentivized to hire students with vocational training rather than outsourcing jobs internationally.
- A public-private partnership could be formed to work on building a pipeline of trained workers to install solar panels.
- A partnership between solar companies and an engineering program at one or more universities could be formed to train workers in solar installation.

Expansion of Funding for Job Training

- Provide trade job opportunities that are relevant to the community. Fill gaps within existing job programs by supporting community programs that seek to teach skills employers need.

Domestic Exchange Programs

- Fund the growth of domestic exchange programs that exist to share expertise on environmental sciences based on geographic location. Support a project that allows universities in rural, suburban, and urban areas to collaborate and share knowledge based on the strengths of each institution's location.

Data Collection by Universities

- Build funding into government energy initiatives for universities to perform studies, suggest metrics to governments, and act as respected neutral parties in data collection. Create project-based collaborative working groups among governments, universities, and businesses.

Universities for Energy Resilience

- Create a collaborative working group of universities to study and develop a standard process to understand what energy resilience means and how it should be measured.
- As a follow-on to the above, establish energy resilience hubs.

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Energy Justice Report Conclusion

Energy justice is complex and multi-faceted. For successful outcomes, an interdisciplinary approach is needed. With experts from various fields of study and practice, the Energy Justice Forum set the grounds for how to approach energy justice from four vantage points:

1. Community Impact and Implementation
2. Cyberinfrastructure and Data Science
3. Energy Research and Development
4. Policy, Legal, and Regulatory

Participants in the forum emphasized that energy justice means that resources and benefits are flowing to the proper recipients, and that projects and policies reflect input from the communities they serve. A thought from Dr. Sean J. Hearne, SURA's President and Chief Executive Officer, summarizes the intention of energy justice: "It is not just about making it so the system helps the most people, but so the system helps the people most in need."

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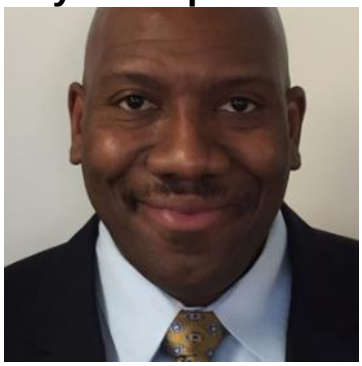
Speakers

Keynote Speaker



As part of the Energy Administration, Daniel White wors on renewable energy policy and programs. His most recent projects focus on energy strategy and initiatives to increase access to reliable, clean, and affordable energy in the District of Columbia.

Daniel White, Energy Program Specialist with the Department of Energy and Environment

Panelists

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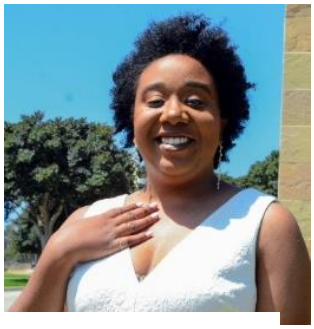
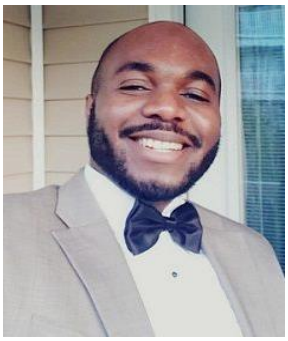
Mozine Lowe, Center for Energy Education

Katie MacCormick, Dominion Energy



Dr. Simone Stewart, National Wildlife



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Energy Justice Forum Agenda

September 30 – October 1, 2022
Washington, D.C.

Friday, September 30

9:00 a.m.	Sign-In & Coffee Provided
9:30 a.m. – 11:00 a.m.	General Opening Session • Welcome – Dr. Sean Hearne, President & CEO of SURA • Keynote – Daniel White, Energy Program Specialist, D.C. Department of Energy and Environment • Ice Breaker – What is Energy Justice? Facilitator: Dr. Omar Faison, Virginia State University
11:00 a.m.	Break
11:30 a.m. – 12:30 p.m.	Panel Discussion #1 – Energy Justice Research & Community Impact Moderator: Dr. Saniya LeBlanc, The George Washington University R. Denise Everson, ThinkBox Mozine Lowe, Center for Energy Education Katie MacCormick, Dominion Energy Dr. Simone Stewart, National Wildlife Federation
12:30 p.m.	Lunch provided
1:30 p.m. – 3:30 p.m.	Breakout Groups Round 1 • Community Impact & Implementation Facilitator: Dr. Saniya LeBlanc, The George Washington University Scribe: Naomia Suggs-Brigety, The George Washington University • Cyberinfrastructure & Data Science Facilitator: Dr. Walter Lowe, Howard University Scribe: Sameer Bhosle, The George Washington University • Energy Research & Development Facilitator: Dr. Omar Faison, Virginia State University Scribe: Bengisu Şişik, The George Washington University • Policy, Legal, & Regulatory Facilitator: Aida Lebbos, SURA Scribe: Clarissa Smith, Howard University
3:30 p.m.	Break
4:00 p.m. – 5:00 p.m.	Breakout Groups Round 1 Reports

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Saturday, October 1

9:00 a.m.	Sign-In & Coffee Provided
9:30 a.m.-10:30 a.m.	Panel Discussion #2 – **High-Performance Computing, Artificial Intelligence, Machine Learning, and Data Science in Energy Research** Moderator: Dr. Omar Faison, Virginia State University Dr. Tricia Youngbull, MITRE Dr. Elvis Moleka, Groundswell
10:30 a.m.	Break
11:00 a.m. – noon	Breakout Groups – Round 2 • **Community Impact & Implementation** Facilitator: Dr. Omar Faison, Virginia State University Scribe: Naomia Suggs-Brigety, The George Washington University • **Cyberinfrastructure & Data Science** Facilitator: Dr. Sean Hearne, SURA Scribe: Sameer Bhosle, The George Washington University • **Energy Research & Development** Facilitator: Dr. Saniya LeBlanc, The George Washington University Scribe: Bengisu Şişik, The George Washington University • **Policy, Legal, & Regulatory** Facilitator: Dr. Robert Orttung, The George Washington University Scribe: Sara Owre, Groundswell
noon	Lunch provided
1:00 p.m. – 2:00 p.m.	Breakout Groups Round 2 Reports & Closing Remarks
2:00 p.m.	Break
3:00 p.m. – 5:00 p.m.	Writing - Draft Summary Report of Workshop