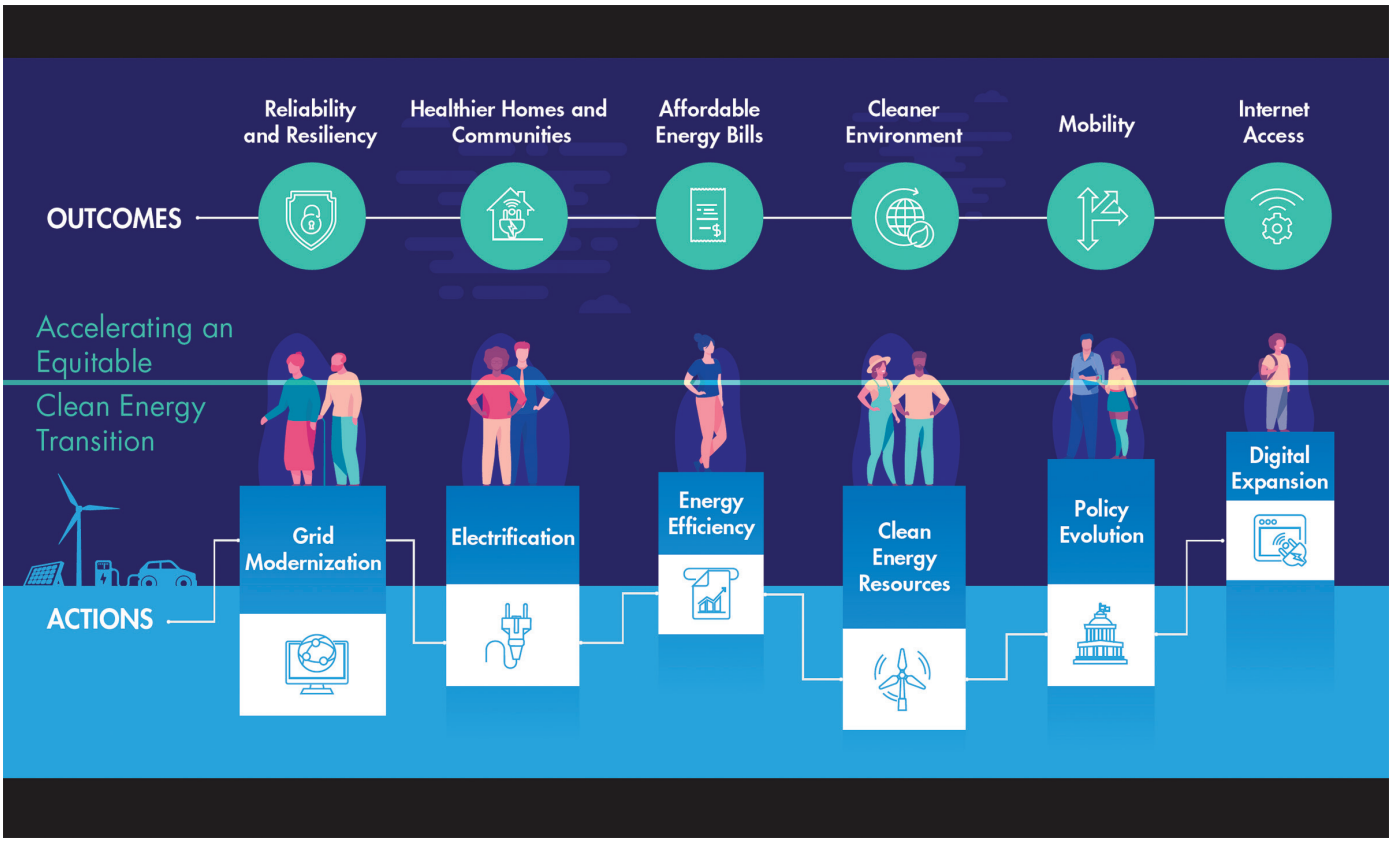
ENVIRONMENTAL JUSTICE AND RENEWABLE ENERGY AND STORAGE



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Executive Summary

The modern energy network is changing rapidly with new developments in siting and operation of renewable energy generation and battery electric storage systems. In 2021, wind, solar, and battery storage accounted for 81% of all new capacity added in the United States and produced an estimated 13% of electric power generation nationwide. Even if these developments are widely regarded as highly beneficial activities that contribute to the de-carbonization of the economy and grid modernization, these projects may also raise challenges for the communities in which they are located – challenges that may include environmental justice (or EJ) issues.

Not unlike other energy projects, integrating environmental justice considerations into renewable energy and battery storage projects entails acting proactively to ensure the "meaningful engagement" of all communities, including environmental justice communities, in the process of planning, development, and operation of projects. It also includes developing concrete and implementable risk mitigation strategies to address impacts, and actionable community benefits directly related to the proposed project and predicated on immediate community needs.

This white paper aims to be a practical resource for utility companies to identify environmental justice implications in the development of renewable energy and battery storage facilities, and to consider both challenges and opportunities in addressing these concerns. While it is not an exhaustive compilation of all the ways in which environmental, health, economic, or social burdens might affect communities, it suggests approaches that can be implemented to identify relevant communities and engage with actual community concerns. It also delineates a set of leading practices to advance each of the dimensions of environmental justice when siting, designing, constructing, operating, and decommissioning these facilities.

Environmental Justice in the Energy Context

Environmental Justice considerations around the development of renewable energy and battery storage projects may arise from diverse sources including federal, state, and local policies and investor commitments:

- Federal permitting requirements may incorporate environmental justice analysis under the National Environmental Policy Act (NEPA), as agencies evaluate the environmental and related social and economic effects of their proposed actions, which include disproportionately high and adverse human health and environmental effects to low-income, minority, and tribal populations as well as mitigation measures.
- Some states have also enacted environmental justice laws or have included environmental justice provisions in state laws that might be applicable to permitting programs for renewable energy and battery storage projects. Cities around the country are also updating their zoning and land-use permitting requirements to include environmental justice considerations.
- State Public Utility Commissions may have adopted or have been directed to adopt regulations or guidance relating to environmental justice.
- Tax and grant programs from the federal and/or state governments may also include environmental justice elements.
- Corporate and investor goals for energy companies may drive the integration of environmental justice considerations in private governance practices.

What Is Environmental Justice?

Defining environmental justice can be challenging because of its local, national, and even international scope. Many advocates and grassroots organizations refer to the 17 "Principles of Environmental Justice" adopted by the 1991 First National People of Color Environmental Summit as the guiding principles of Environmental Justice. The United States Environmental Protection Agency (EPA) defines environmental justice as "the fair treatment and meaningful involvement of all people regardless of race, color, national origin,

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or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies." Some states have also developed their own definitions of environmental justice expanding on the federal definition.

For the purposes of the Electric Power Research Institute's (EPRI) research:

- "Environmental Justice" refers to fair treatment and meaningful involvement regarding environmental impacts and access to environmental benefits
- "Equity" means fair treatment in how benefits and burdens are distributed throughout society and meaningful involvement regardless of ability, race, or socioeconomic status
- "Energy Equity" stands for affordable and fair access to energy services and benefits and involvement in related decision-making.

Scholars and practitioners have identified several dimensions of environmental justice. The dimensions analyzed in this study are:

How to Identify Environmental Justice Communities

Renewable energy and battery storage project developers may be dealing with multiple EJ communities rather than a single community. Even if demographically similar, communities are not monolithic. It is important to understand both differences and commonalities. Communities are likely to have varying concerns, histories, interests, cultural beliefs, and capacities for engagement. At the same time, different demographically defined groups may share common concerns, such as the effect of ongoing or historic pollution, lack of transportation and access to well-paying jobs, or patterns of public and private disinvestment.

Socio-demographic characteristics may help project developers identify environmental justice communities. Among the factors that are used are the extent to which a defined community or population that is potentially affected by a project can be characterized as:

- low-income
- linguistically isolated/having fewer speakers of English
- having fewer years of education
- experiencing high unemployment
- enduring historic loss of employment/employers
- suffering from a preponderance of poor health indicators
- having a lower life expectancy
- having lower median home values
- a meaningful number of Black, indigenous, or people of color (BIPOC) residents.

Additionally, environmental characteristics can also suggest environmental justice concerns in the community such as: substandard housing conditions (lead paint, lead water service lines, lack of energy efficiency, poor construction/maintenance); high pollution exposure burdens; proximity to waste facilities; deficits in public services/public infrastructure; and vulnerability to flooding, climate change, or other environmental hazards.

Potential Concerns of EJ Communities

While the general perspective is that renewable energy and battery storage systems produce greater benefits and fewer risks than their fossil fuel counterparts, notable community concerns associated with utility-scale or large-scale solar, wind, and battery storage projects persist. These concerns might be amplified within the EJ context in a variety of ways. This report highlights ways in which environmental justice concerns may affect or enhance some or any of these.

Examples of potential concerns included in the report are:

Effect on property values. Homeownership is a significant source of wealth and security for many people, and in many environmental justice communities it may constitute the only meaningful asset. Some EJ communities may experience a proposed energy facility as

another instance in a long history of discrimination that prevented access to the fullest benefits of homeownership and the prospect of a new or changing facility potentially depressing values may suggest an exploitation model of development.

Health impacts. Environmental justice communities may already face disproportionate environmental health burdens. It is important to consider these factors even though they may seem negligible. This includes the changes in environmental conditions that may raise community concerns. For example, communities may be concerned about dust from construction and possible respiratory impacts.

Impact on cultural, historic, or religiously important sites. Communities may object to development of a project due to the significance of the site selected or affected by the selected site. A proposed wind farm or solar farm located on a sacred or cultural site for indigenous peoples, or impeding access to such a site, may raise opposition from affected tribes and members. A project site located in an area where a sensitive event occurred, including instances of historic violence and injustice, could raise objections from survivors or descendants.

Impact on sacred or significant cultural resources. While the site itself may not have special status, environmental justice communities may also have concerns if the use of the site could interfere with other significant values. An indigenous community may object to a wind project if its members believe the project will endanger a culturally valued bird or bat species, or if a solar farm is proposed for an area where a plant used in cultural or religious practices is gathered.

Fishing and coastal resource dependency. In areas with offshore wind development, EJ communities connected to fishing, whether through employment or for cultural reasons, may also have concerns that include possible effects on livelihoods. Numerous Native American tribes exercise fishing rights in various coastal waters of the United States, and Alaska natives have significant subsistence rights. Indigenous treaty rights may also include expectations and guarantees about access to lands and to fish and wildlife resources; these can apply even where the lands are not owned by a tribe.

Integrating EJ into Renewable Energy and Battery Storage Projects

Meaningful engagement

One of the most important aspects of incorporating environmental justice into project-related decisions is "meaningful engagement" with the relevant communities. It is important to understand that EJ communities are often accustomed to being affected by actions without much, if any, consultation, or engagement.

Meaningful engagement with communities can take many forms and appropriate techniques for engagement include a range of actions. Different techniques may be best suited to various stages of a project.

Some techniques for meaningful engagement include:

- Early consultation that is active, not reactive nor pro forma.
- Understand who from a community may have useful or important information.
- Listen in order to learn.
- Plan for meaningful engagement that includes follow-through, determining whether objectives are being met or whether the plan itself needs to be modified in order to be effective.
- Format and design interactions that are based on and within the local community and that ensure accessibility.
- Employ techniques to build respect or trust even when parties are not in agreement at various points.
- Provide training and/or opportunities for community members to develop expertise and understanding.
- Co-own/develop safety plans and commitments on operation.

Concrete and implementable risk mitigation strategies

Consideration of the siting, design, and operation of the project can help a company plan to recognize opportunities to address environmental justice concerns through the dimensions of procedural justice, distributive justice, recognition justice, and restorative justice. Waiting until after site selection and design are complete or nearly complete to consider these issues may constrain a company's ability to consider and implement effective alternative design options that may better suit the needs of the stakeholders and enable more successful regulatory and other approvals.

Siting approaches for mitigation. While the use of siting tools by the industry is well developed with respect to evaluating wind and solar resources, access to transmission, and avoiding conflicts

with endangered species or high biodiversity areas, there is now a substantial opportunity to pioneer sensitive siting in the context of environmental justice concerns. Taking advantage of environmental justice screening tools (e.g., EPA's EJSCREEN) early in the process can help identify potential communities of concern as well as ways in which to anticipate and address objections.

Design and operating approaches. The rapid rise and increasing number, capacity, and land footprints of utility-scale renewable energy and battery storage is quickly drawing attention to the need for developers to directly engage with community concerns or objections. Depending on community concerns, changes to the footprint/impact area of a project may help resolve conflicts. Visual and/or noise impacts could also raise public health concerns or cultural concerns for community members. Impacts to agricultural lands can be associated with loss of livelihoods or land that historically was used for farming. Exploring ways for multiple land uses such as grazing, compatible farming, pollinator habitat, or native vegetation could be an avenue to address community resistance. Furthermore, the removal of all vegetation from a site could impact surrounding wildlife and raise issues with runoff and loss of soil and sediment. Revegetation could be used as an opportunity for addressing possible concerns with runoff and herbicide use. Ensuring compliance with minimum regulatory standards and going beyond those minimum standards, when possible, enhances the credibility of the project proponents and of the project's allies in the community.

Community Benefits. Project developers have opportunities to not only mitigate unavoidable impacts of their projects, but also to identify and provide community benefits. Some of the benefits include creation of jobs and job security, access to renewable energy, energy efficiency, grid resilience, brownfields redevelopment, and investments in other community initiatives such as infrastructure upgrades or community co-ownership of projects sited within their community. Community benefits agreements are also an instrument that may be used to provide mutual accountability in distributing community benefits.

Project developers can use metrics to establish targets, track progress, and create accountability in meeting their proposed goals. However, a metrics-based approach can be challenging to implement and might not be the best method to reflect the progress made with communities on some fronts, such as building trust and respect. Measurable outcomes that can be identified vary depending on the actions taken and on the stage of the project. While not an exhaustive list, these metrics can include increasing efforts to meaningfully engage communities such as the number of public meetings held and where they are held, the increase of grid resiliency in critical community infrastructure such as health care centers, the decrease in share of household income spent on fuel and electricity, the decrease in income inequality, and the increase in local energy measured in gigawatt hours (GWh) generated per year.

Leading Practices

Key practices that can help project developers respect and advance environmental justice goals while advancing renewable energy and battery storage system deployments include:

1. During the site selection process, determine whether the vicinity includes one or more EJ communities, using a screening tool and other information.
2. Evaluate project approaches and opportunities for meaningful engagement, mitigation, and benefits with respect to all four of the environmental justice dimensions to determine what impacts may be perceived and how each may be addressed.
3. Undertake meaningful engagement using a stepwise approach.
4. Design mitigation approaches collaboratively to address community concerns.
5. Identify and implement community benefits.

KEY INSIGHTS

Even developments widely regarded as "clean energy" may raise environmental justice issues. Projects that contribute to decarbonization of the economy and grid modernization can create challenges for the communities where they are located.

Awareness of what environmental justice is and its four dimensions. To integrate environmental justice considerations into the development, siting, and operation of renewable energy and battery storage projects, it is crucial to understand environmental justice and its four dimensions (Distributive Justice, Procedural Justice, Recognition Justice, and Restorative Justice).

Identifying environmental justice communities. Even though communities might share common sociodemographic backgrounds and concerns, communities are not monolithic. Understanding both differences and commonalities by using a screening tool and "ground-truthing" the information is important.

Meaningful engagement of environmental justice communities in the planning, development, and operation of renewable energy and battery storage projects. Meaningful engagement with communities can take many forms and appropriate techniques for engagement include a range of actions depending on community characteristics and needs.

Developing concrete and implementable risk mitigation strategies. Consideration of environmental justice elements in the siting, design and operation of the project can help a company plan to address environmental justice concerns by applying the environmental justice dimensions.

Working collaboratively with communities to identify actionable community benefits. Developers have opportunities to seek not only mitigation of unavoidable impact of their projects, but also the identification and provision of community benefits such as the creation of jobs, providing access to renewable energy, and improving grid resiliency.

Leading the advancement of environmental justice in the industry. Project developers have the opportunity to become industry leaders in this space. Avenues can be established for information-sharing with peers with regard to best practices for incorporating environmental justice considerations into the development, siting and operation of renewable energy and battery storage projects.

Introduction

Changes in the modern energy network are occurring rapidly, with development, siting, and operation of renewable energy generation and battery electric storage systems. In the United States, wind, solar, and battery storage accounted for 81% of all new electricity generating capacity added in 2021[1]; and produced approximately 13% of electric power generation nationally.[2] In the twelve months from June 2021 to June 2022, 17.6 gigawatts (GW) of new utility-scale solar capacity came into service in the U.S., bringing utility-scale solar generation capacity to 65.8 GW. In the same period, utility-scale wind installations added 14.3 GW, bringing the cumulative total to 137.6 GW.[3] Utility-scale battery energy storage, either integrated with renewable generation facilities or standalone, has also increased substantially, with total capacity of utility-scale battery storage reaching 4.6GW by the end of 2021[4].

These developments are widely regarded in the industry and by public policy makers as highly beneficial activities, contributing to de-carbonization of the economy, modernizing the electric power sector, and displacing facilities that have greater environmental effects and health impacts on human communities. Nevertheless, like any new development activity, these projects also raise challenges for the communities in which they may be located. Community concerns such as exposure to pollution, land loss, interference with cultural and traditional values, and natural resource exploitation, involve environmental justice – issues that in the past have been associated more often with the siting and operation of industries such as chemical manufacture or petroleum refining, fossil fuel electric power plants, and solid waste treatment, storage, and disposal facilities. And, while this paper focuses on utility-scale renewable energy, environmental justice concerns can arise with smaller developments in or that impact disadvantaged communities.

Integrating environmental justice into renewable energy and battery storage projects entails proactive actions in the process of development, siting, and operation of these projects. These actions include:

- **ensuring meaningful engagement** of environmental justice communities in the process of planning, development, and operation of projectsidentifying concrete and implementable **risk mitigation strategies**
- identifying **community benefits** directly related to the proposed project and predicated on community needs.

Environmental Justice in the Energy Context

Environmental justice considerations for the electric power sector arise from a variety of sources: federal, state, and local requirements and policies, as well as corporate and investor commitments. Considering the rights, needs, and requests of environmental justice communities is also good professional practice and can help minimize common hurdles that stem from local resistance of energy

1 "Renewables account for most new U.S. electricity generating capacity in 2021," U.S. Energy Information Administration, Jan. 11, 2021. https://www.eia.gov/todayinenergy/detail.php?id=46416; Authors' simple calculations

2 "What is U.S. electricity generation by energy source?," U.S. Energy Information Administration, March 4, 2022. https://www.eia.gov/tools/faqs/faq.php?id=427&t=3; Authors' simple calculations

3 "Today in Energy," U.S. Energy Information Administration, Sept. 9, 2022. https://www.eia.gov/todayinenergy/detail.php?id=53779

4 "Duration of utility scale batteries depends on how they're used," U.S. Energy Information Administration, March 25, 2022. https://www.eia.gov/todayinenergy/detail.php?id=51798

projects. Furthermore, the energy transition offers opportunities to engage with and meet the needs of disadvantaged and disproportionately impacted communities by delivering environmental benefits, economic opportunities, and innovation, and ensuring equal distribution of benefits and burdens.

Federal policies require that agencies identify and address disproportionately high and adverse effects of their programs, policies, and activities on minority and low-income populations.[5] Federal permitting requirements may incorporate environmental justice analysis under the National Environmental Policy Act (NEPA), as agencies consider the environmental and related social and economic effects of their proposed actions. In this NEPA analysis, agencies are required to identify disproportionately high and adverse human health and environmental effects that impact low-income, minority, and tribal populations as well as viable mitigation measures.[6]

The U.S. Environmental Protection Agency (EPA) has also identified a variety of opportunities where the agency can advance environmental justice through its statutes, civil rights laws, and regulations.[7] For example, the EPA has identified various opportunities to advance environmental justice under New Source Review preconstruction permitting under the Clean Air Act (CAA) for major sources of air pollution or major modifications of new sources, by extending public comment periods, holding multiple hearings, providing translation services in public meetings in areas with limited English proficiency, and inviting community groups to meet with officials prior to the development of a draft permit.[8] Under Title VI of the Civil Rights Act, the EPA has a responsibility to ensure that recipients and subrecipients of federal financial assistance from the EPA (including states, municipalities, and other public and private entities) comply with federal civil rights laws that prohibit discrimination on the basis of race, color, national origin (including limited English proficiency), disability, sex, and age.[9] Additionally, "EPA has authority under 40 C.F.R. part 7 to ensure recipients' [of EPA financial assistance] siting decisions do not have a discriminatory effect based on a protected status."[10]

Some states also have enacted environmental justice laws or have included environmental justice provisions in state laws that might apply to permitting programs. Nearly a dozen states apply such standards to some of their programs, and environmental justice may arise even under pre-existing siting and permitting laws.[11] For example, the Energy Policy of Virginia sets out a goal to ensure that "development of new, or expansion of existing energy resources or facilities does not have a disproportionate adverse impact on economically disadvantaged or minority communities."[12] The U.S. Court of Appeals for the Fourth Circuit recently applied Virginia's existing air pollution law together with these provisions and found that the state had failed to conduct an adequate analysis of the potential impacts of a natural gas pipeline compressor station on a community of color in which the facility was to be located.[13]

State Public Utility Commissions also have adopted, or been directed to adopt, environmental justice regulations or guidance applicable to renewable energy and storage projects. In California, the Public Utilities Commission adopted an Environmental and Social Justice Action Plan to guide its decision-making and ensure that its broad regulatory authority continues to advance environmental equity throughout the state.[14] This plan was recently updated in early 2022 to reinforce community engagement by requiring engagement plans to reach out to vulnerable communities and advance equity; it includes the actions electric and gas utilities should take and seeks to address the inclusion of underrepresented communities in decision-making processes.[15]

5 Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations," 59 Fed. Reg. 7629, 1994. https://www.archives.gov/files/federal-register/executive-orders/pdf/12898.pdf

6 "Environmental Justice Guidance Under the National Environmental Policy Act." Council on Environmental Quality, 1997. https://www.epa.gov/sites/default/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf.

7 "EPA Legal Tools to Advance Environmental Justice." U.S. Environmental Protection Agency, May 2022. https://www.epa.gov/system/files/documents/2022-05/EJ%20Legal%20Tools%20May%202022%20FINAL.pdf. "Environmental Justice and Civil Rights in Permitting FAQs." U.S. Environmental Protection Agency, August 2022. https://www.epa.gov/system/files/documents/2022-08/EJ%20and%20CR%20in%20PERMITTING%20FAQs%20508%20compliant.pdf; This resource provides information to the EPA, federal, tribal, state, and local environmental permitting programs on how to integrate EJ into their permitting processes

8 *EPA Legal Tools to Advance Environmental Justice*

9 42 U.S.C. 2000d et seq.; *EPA Legal Tools to Advance Environmental Justice*

10 *EPA Legal Tools to Advance Environmental Justice*

11 Gerard, Michael B.; McTiernan, Edward. "Emerging State-Level Environmental Justice Laws." *New York Law Journal*, Vol. 265, No. 91, May 13, 2021. https://climate.law.columbia.edu/sites/default/files/content/NYLJ05122021492784Arnold.pdf

12 Va. Code Ann. Section 67-102(A)(11).

13 *Friends of Buckingham v. State Air Pollution Control Bd.,* 947 F. 3d 68 (4th Cir. 2020). Available at: https://cases.justia.com/federal/appellate-courts/ca4/19-1152/19-1152-2020-01-07.pdf?ts=1578427219

14 *Environmental & Social Justice Action Plan Version 2.0.* California Public Utilities Commission, April 7, 2022. https://www.cpuc.ca.gov/-/media/cpuc-website/divisions/news-and-outreach/documents/news-office/key-issues/esj/esj-action-plan-v2jw.pdf

15 "CPUC Adopts Updates to Environmental and Social Justice Action Plan,"

Some cities across the country are also modifying their zoning and land-use permitting process to include environmental justice considerations. For example, urban areas such as Fulton County, Georgia; San Francisco, California; and Camden and Newark, New Jersey[16] have all established processes to review certain developments through an environmental justice lens.[17] At the same time, other cities have implemented comprehensive plans that guide future development and impose new standards to advance environmental justice.[18] These may have a substantial effect in locations where wind, solar, or battery storage projects require local zoning approval.

Federal and state grant and tax credit programs also drive some environmental justice concerns. For example, the 2022 federal Inflation Reduction Act (IRA) provides investments in the form of tax credits and grants to accelerate the transition to clean energy and reduce emissions.[19] Executive Order 14082, "Implementation of the Energy and Infrastructure Provisions of the Inflation Reduction Act of 2022," establishes that the IRA sets out to "improve public health and advance environmental justice and economic opportunity for frontline communities who disproportionately bear the brunt of cumulative exposure to industrial and energy pollution."[20] Furthermore, the Order directs all agencies implementing the law to prioritize "promoting construction of clean energy generation, storage, and transmission, and enabling technologies through efficient, effective mechanisms that incorporate community engagement."[21]

Some states offer subsidies or incentives to develop renewable energy and energy storage, including states such as Hawaii, Maryland, California, and Nevada, for customer-sited stationary storage systems or behind the meter storage. These policies could be amended in the future to provide more incentives and subsidies for developing projects in underserved communities.[22]

Environmental justice considerations may also be driven by corporate and investor goals for companies in the energy sector. Companies are increasingly embracing the importance of environmental management and sustainability,[23] and private governance practices are starting to complement public environmental justice efforts.[24] Companies are setting voluntary standards and often going beyond requirements based on government intervention or policy mandates to take proactive steps to support environmental justice communities.[25] Similarly, it has become more common for investors to search for companies with robust and tangible environmental, social, and governance (ESG) criteria. ESG criteria "are a set of standards for a company's behavior used by socially conscious investors to screen potential investments and to encourage companies to act responsibly."[26] The considerations for environmental criteria include how a company safeguards the environment, for example, by addressing upstream supply chain impacts or greenhouse gas emissions. The social criteria are geared toward how companies deal with their employees, suppliers, customers, and the surrounding communities; and governance examines leadership, executive pay, shareholder rights, audits, and internal controls.[27] ESG efforts can also help promote environmental justice by focusing on expand-

California Public Utilities Commission, April 7, 2022. https://www.cpuc.ca.gov/news-and-updates/all-news/cpuc-adopts-updates-to-environmental-and-social-justice-action-plan

16 Not an exhaustive list.

17 Javorsky, Nicole. "Which Cities Have Concrete Strategies for Environmental Justice?," *Bloomberg*, May 7, 2019. https://www.bloomberg.com/news/articles/2019-05-07/mapping-policies-for-environmental-justice (Accessed September 22, 2022).

18 *Local Policies for Environmental Justice: A National Scan*. Tishman Environment and Design Center, February 2019. https://www.nrdc.org/sites/default/files/local-policies-environmental-justice-national-scan-tishman-201902.pdf

19 *Summary of the Energy Security and Climate Change Investments in the Inflation Reduction Act of 2022*. https://www.democrats.senate.gov/imo/media/doc/summary_of_the_energy_security_and_climate_change_investments_in_the_inflation_reduction_act_of_2022.pdf

20 Section 1(d), E. O. 14082 "Implementation of the Energy and Infrastructure Provisions of the Inflation Reduction Act of 2022," 87 Fed. Reg. 56861. September 12, 2022. https://www.federalregister.gov/documents/2022/09/16/2022-20210/implementation-of-the-energy-and-infrastructure-provisions-of-the-inflation-reduction-act-of-2022

21 Section 2(d), E. O. 14082 "Implementation of the Energy and Infrastructure Provisions of the Inflation Reduction Act of 2022," 87 Fed. Reg. 56861. September 12, 2022. https://www.federalregister.gov/documents/2022/09/16/2022-20210/implementation-of-the-energy-and-infrastructure-provisions-of-the-inflation-reduction-act-of-2022

22 McNamara, Will; Passell, Howard; Montes, Marisa; Jeffers, Robert; Gyuk, Imre. "Seeking energy equity through energy storage," *The Electricity Journal*, Vol. 35, 2022. p. 3. https://reader.elsevier.com/reader/sd/pii/S1040619021001548?token=E817B8C6AD1745378C0B77F93D124284F8F60A7A663D08F909B71E5A3361CB02B3345FE5F874DE5824A40C2D75A171C2&originRegion=us-east-1&originCreation=20221014202518.

23 Fisk, Sally R.K. "ESG Standard on Environmental Justice Can Drive Greater Progress," *The Environmental Forum*, Environmental Law Institute, May–June 2021. https://www.eli.org/the-environmental-forum/esg-standard-environmental-justice-can-drive-greater-progress

24 Light, Sarah E.; Vandenbergh, Michael P. "Private Environmental Governance" (August 17, 2015). *Environmental Decision Making, Encyclopedia of Environmental Law*, Paddock, Lee; Glicksman, Robert L.; Bryner, Nicholas S. eds., Edward Elgar, Edward, 2016. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2645953

25 Fisk, "ESG Standard on Environmental Justice Can Drive Greater Progress."

26 "What are Environmental, Social, and Governance (ESG) criteria?," Investopedia. https://www.investopedia.com/terms/e/environmental-social-and-governance-esg-criteria.asp (Accessed September 21, 2022).

27 "What are Environmental, Social, and Governance (ESG) criteria?."

ing diversity in their board membership and executive leadership, educating staff on environmental justice principles, and including environmental justice in the company's private governance efforts to make them implementable policies.[28]

Apart from the various drivers described above, including environmental justice considerations as part of a company's standard procedure is good practice. While the primary focus of environmental justice is ensuring that traditionally overburdened communities are fairly and respectfully represented in decision-making and experience an equitable distribution of benefits and burdens, the resulting trust created between the parties also helps companies and communities convey needs and exchange ideas to overcome potential miscommunication and resistance to energy infrastructure projects based on prevailing mistrust and prejudices.[29] Securing local interest and support entails going beyond the minimum public outreach obligations and ensuring that the process is equitable for all of those affected. This, in turn, contributes to the creation of good relationships that can aid in the company's "competitive longevity."[30] Moreover, characterizing the benefits and burdens of clean energy is important to local communities, particularly to low-income households that face disproportionate economic, environmental, and resiliency challenges as well as other barriers that make it difficult to participate in the energy transition.[31]

The Purpose of this Report

This paper is primarily designed to identify environmental justice implications related to the development of renewable energy and battery storage facilities, and to consider both challenges and opportunities in addressing these concerns. It does not attempt to identify all the ways in which environmental, health, economic, or social burdens might affect communities, but rather suggests approaches that can be used to identify relevant communities, engage with actual community concerns, and apply best practices to advance each of the dimensions of environmental justice when siting, designing, constructing, operating, and decommissioning these facilities.

Utility and large-scale ground-mounted photovoltaic (PV) solar installations. These facilities typically range from 5MW to 100MW AC output (although some exceed 400MW) and occupy up to several thousand acres of land. Consisting of mounted solar panels, plus inverters/transformers, and transmission infrastructure, large-scale solar PV facilities typically occupy 4–7.5 acres/MW capacity, and often require additional land for site management, support, and access.[32] As the technology develops and deploys in more locations, fixed-tilt systems are increasingly giving way to tracking PV systems (that follow the course of the sun).[33] Public concerns frequently include that the sites occupy farmlands and greenfield sites, stormwater runoff, reflection/glare, and questions related to the panels' composition (silicon, boron, phosphorous, trace metals).

Commercial/utility-scale wind installations. Onshore wind projects, comprised of multiple wind turbines generally totaling 20MW–200MW, make up a substantial proportion of new electricity generating capacity, and are being sited in widely varying geographies.[34] The technology has advanced rapidly, and newer individual wind turbines at recently constructed utility-scale projects are rated at an average of 2.8MW or 3MW[35], although the largest reach 4–5MW.[36] The average hub height of turbines installed in 2021 was approximately 94 meters and the average rotor diameter was approximately 128 meters.[37] Typical utility-scale wind farms

28 Almanzar, Jose; Schauwecker, Paula. "How ESG Can Promote Environmental Justice," American Bar Association, 2021.
29 Sanders, Deidre. "Ignoring Environmental Justice Concerns is Risky Business," *Triple Pundit*, July, 2013. https://www.triplepundit.com/story/2013/ignoring-environmental-justice-concerns-risky-business/59181 (Accessed on September 21, 2022).
30 Sanders, "Ignoring Environmental Justice Concerns is Risky Business."
31 "Equity and Environmental Justice Considerations for a Clean Energy Transition." EPRI, April 28, 2021. p. 4. 3002021206
32 Ong, Sean; Campbell, Clinton; Denholm, Paul; Margolis, Robert; Heath, Garvin. "Land-Use Requirements for Solar Power Plants in the United States" (NREL Technical Report NREL/TP-6A20-56290). National Renewable Energy Laboratory, June 2013. https://www.nrel.gov/docs/fy13osti/56290.pdf (7.2 acres/MWAC for utility scale); Bolinger, Mark; Bolinger, Greta. "Land Requirements for Utility-Scale PV: An Empirical Update on Power and Energy Density," *IEEE Journal of Photovoltaics*, Vol. 12, no.2, March 2022. https://ieeexplore.ieee.org/document/9676427 (Power density: 0.35 MWDC/acre for fixed-tilt and 0.24 MWDC/acre for tracking plants.); Walston, L. J.; Li, Y.; Hartmann, H. M.; Macknick, J.; Hanson, A.; Nootenboom, C.; Lonsdorf, E.; Hellmann, J. "Modeling the Ecosystem Services of Native Vegetation Management Practices at Solar Energy Facilities in the Midwestern United States," *Ecosystem Services*, Vol.47, 2021. https://doi.org/10.1016/j.ecoser.2020.101227 (7.5 acres/MWAC)
33 Bolinger, Mark; Seel, Joachim; Warner, Cody; Robson, Dana. "Utility-Scale Solar, 2022 Edition (Technical Brief)." Berkeley Lab, September 2022. https://emp.lbl.gov/sites/default/files/utility-scale_solar_2022_technical_brief.pdfhttps://emp.lbl.gov/utility-scale-solar/
34 See generally, *Land-Based Wind Market Report.* U.S. Department of Energy, 2022, https://emp.lbl.gov/sites/default/files/2022_land_based_wind_market_report.pdf
35 Stehly, Tyler; Duffy, Patrick. "2020 Cost of Wind Energy Review." National Renewable Energy Laboratory, 2022. https://www.nrel.gov/docs/fy22osti/81209.pdf; *Land-Based Wind Market Report*, pp. vii, 24
36 Larger turbines can be searched for using USGS's U.S. Wind Turbine Database, available at https://eerscmap.usgs.gov/uswtdb/
37 *Land-Based Wind Market Report*, pp. vii, 24

occupy many thousands of acres, but the immediate footprint of the turbines and facilities is relatively small.[38] Compatible land uses, usually agricultural, may be available. Public concerns frequently include visual impact, noise, land use and land values, and safety. Offshore wind projects are larger in terms of both generating capacity and areal extent. Current projects, mostly still in development, are in the 800–1,500MW range. They are included in this review due to the potential onshore impacts to communities relating to both the wind facilities themselves (and uses of waters) as well as from the related onshore infrastructure.

Utility-scale battery energy storage systems. The utility-scale battery storage systems considered in this paper range from 20MW–100MW, and some are even larger. These systems, as well as smaller systems, may be co-located with renewable generating facilities, or they may be standalone utility-scale battery storage, either adjacent to or inside existing substations or purpose-built facilities. Even if related to renewables, in some cases the best location for storage may not be co-located with renewable generation but elsewhere, providing greater flexibility and multiple resilience functions for transmission and distribution infrastructure. Although the Energy Information Administration (EIA) had not released updated data for U.S. additions to utility-scale battery energy storage capacity in 2021, preliminary data suggests a 458MW increase in 2020.[39] Currently, there are more than 4.6GW of utility-scale battery storage systems operational in the U.S.[40] Hybrid projects (usually constructed with solar PV projects) constitute most of the planned projects in the near future.[41] Most common battery storage systems use lithium-ion batteries, typically housed in 40-foot shipping containers or newer modular systems. These require effective cooling systems and are typically ground mounted on concrete pads. Battery storage systems also require separate inverters/transformers to convert power, and related support facilities. Public concerns – in addition to general siting issues such as real or perceived impacts to property values – typically relate to site management and safety aspects, including risk of thermal runway, explosion and fire, and associated mitigation technologies and emergency response protocols.

The practices outlined in this paper are drawn from a variety of sources such as transmission line and power plant applications, and not all of these stem from the renewable energy or storage universe. The fossil fuel and chemical industries have a much longer history of work with environmental justice communities, reflecting both successes and failures. In some cases, the practices and policies cited in this work were adopted by organizations whose environmental justice experiences are mixed or resulted from re-evaluating unsuccessful approaches. Still, there are many opportunities to continue learning and implementing leading environmental justice practices.

What Is Environmental Justice?

Definitions of Environmental Justice

Defining "environmental justice" can be challenging due to its local, national, and international scope. The term can encompass a broad range of concerns such as public health, natural resource exploitation and conservation, worker safety, land rights, equal distribution of environmental benefits and burdens, and equal enforcement of environmental law, among others.[42] In the United States, environmental justice has evolved as a social movement and as a research field since the birth of the movement in the 1980s.[43]

For the purposes of EPRI's research:

> "Environmental Justice" refers to fair treatment and meaningful involvement regarding environmental impacts and access to environmental benefits.
>
> "Equity" means fair treatment in how benefits and burdens are distributed throughout society and meaningful involvement regardless of ability, race, or socioeconomic status.
>
> "Energy Equity" represents affordable and fair access to energy services and benefits and involvement in related decision-making.

38 Denholm, Paul; Hand, Maureen; Jackson, Maddalena; Ong Sean. "Land-Use Requirements of Modern Wind Power Plants in the United States" (NREL Technical Report NREL/TP-6A2-45834). National Renewable Energy Laboratory, August 2009. https://www.nrel.gov/docs/fy09osti/45834.pdf (direct impact area 0.74 ac/MW; total area required 30-250 ac/MW).

39 "Battery Storage in the United States: An Update on Market Trends." U.S. Energy Information Administration, August 2021. p 5. https://www.eia.gov/analysis/studies/electricity/batterystorage/pdf/battery_storage_2021.pdf

40 "Duration of utility-utility scale batteries depends on how they're used."

41 "Battery Storage in the United States: An Update on Market Trends," p. 3.

42 Kuehn, Robert. "A Taxonomy of Environmental Justice," *Environmental Law Reporter*, Vol. 30, 2000. p. 10681. https://core.ac.uk/download/pdf/61689017.pdf

43 Jenkins, Kristen. "Setting energy justice apart from the crowd: Lessons from environmental and climate justice," *Energy Research and Social Science Journal*, Vol. 39, May 2018. pp. 117–121. https://www.sciencedirect.com/science/article/abs/pii/S2214629617304309?via%3Dihub

Community Definitions

Among minority and low-income communities, many organizations and advocates still cite the 17 "Principles of Environmental Justice" adopted by delegates to the First National People of Color Environmental Summit in 1991. These principles include, among others, calls for ending the production of all toxins, hazardous wastes, and radioactive materials; recognition of all people's fundamental right to political, economic, cultural, and environmental self-determination; holding producers of waste strictly accountable for damages; the rights of victims of environmental injustice to receive full compensation and reparations; the right of communities to participate as equal partners at every level of decision-making; the right of all workers to a safe and healthy work environment; and the special legal and natural relationship of Native peoples to the U.S. government.[44]

Federal Definitions

In 1994, President Clinton issued Executive Order (E.O.) 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations."[45] While it does not provide a definition of environmental justice, the order directs federal agencies to identify and address disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations, to promote the enforcement of all health and environmental statutes in such areas, to ensure greater public participation and access to information, to improve research and data collection, and to identify differential patterns of consumption of natural resources among these populations. EPA's subsequent definition of the term was informed by the concepts in E.O. 12898.[46] It defines "environmental justice" as:

> the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies.[47]

Two fundamental elements characterize EPA's definition: "fair treatment" and "meaningful involvement." EPA has described fair treatment as the elimination of the disproportionate burden of environmental harms and risks to certain groups of people and expanded the concept to include consideration of how both burdens and benefits are distributed.[48] Meaningful involvement encompasses communicating and connecting with stakeholders early and often, providing accessible information and actively engaging them in the decision-making process.[49] As discussed in a later section, meaningful involvement of low-income and minority populations presents its own set of challenges and opportunities that vary according to the needs of the specific groups involved.

EPA categorizes environmental justice as a goal to be achieved when there is universal enjoyment of the "same degree of protection from environmental and health hazards, and equal access to the decision-making process to have a healthy environment in which to live, learn, and work."[50]

State Definitions

Some states have developed their own environmental justice definitions. For example, California defines "environmental justice" as "the fair treatment of people of all races, cultures, and incomes with respect to the development, adoption, implementation, and enforcement of environmental laws, regulations, and policies."[51] The Illinois Environmental Protection Agency's Environmental Justice Policy defines "environmental justice" as "based on the principle that all people should be protected from environmental pollution and have the right to a clean and healthy environment." The policy states that environmental justice consists of:

- "protecting Illinois's environment and the health of its residents"
- "equity in the administration of state's environmental programs"
- "opportunities for meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies."[52]

44 "17 Principles of Environmental Justice," First Peoples of Color Environmental Leadership Summit, 1991. https://www.ejnet.org/ej/principles.html; *See also* Bullard, Robert D. "Environmental Justice in the 21st Century: Race Still Matters," *Pylon Journal*, Vol. 49, no.3/4, Autumn – Winter, 2001. https://www.jstor.org/stable/3132626

45 Executive Order 12898

46 *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*, U.S. Environmental Protection Agency, May, 2015. https://www.epa.gov/sites/default/files/2015-06/documents/considering-ej-in-rulemaking-guide-final.pdf

47 "Environmental Justice," U.S. Environmental Protection Agency, September 30, 2022. https://www.epa.gov/environmentaljustice (accessed October 24, 2022)

48 *Guidance on Considering Environmental Justice During the Development of Regulatory Actions.*

49 *Guidance on Considering Environmental Justice During the Development of Regulatory Actions.*

50 *"Environmental Justice,"* U.S. Environmental Protection Agency.

51 California's Govt. Code section 65040.12, subd. (e) https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?lawCode=GOV&sectionNum=65040.12.

52 "Environmental Justice Policy," Illinois Environmental Protection Agency,

Massachusetts's Climate Roadmap Law defines environmental justice principles as

> "principles that support protection from environmental pollution and the ability to live and enjoy a clean and healthy environment regardless of race, color, income, class, handicap, gender identity, sexual orientation, national origin, ethnicity or ancestry, religious belief, or English proficiency, which includes (i) the meaningful involvement of all people with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies, including climate change policies, and (ii) the equitable distribution of energy and environmental benefits and environmental burdens."[53]

Although New Jersey's Environmental Justice Law does not directly define "environmental justice," it states that "all New Jersey residents, regardless of income, race, ethnicity, color, or national origin, have a right to live, work, and recreate in a clean and healthy environment." It further stipulates that

> "no community should bear a disproportionate share of adverse environmental and public health consequences that accompany the State's economic growth, that the State's overburdened communities must have a meaningful opportunity to participate in any decision to allow in such communities certain types of facilities which, by the nature of their activity, have a potential to increase environmental and health stressors, and that it is in the public interest of the State, where appropriate, to limit the future placement and expansion of such facilities to overburdened communities." [54]

Distinguishing "Environmental Justice" from Other Terms

It can be helpful to distinguish "environmental justice" from other terms such as "energy justice" and "climate justice" (or "just transition"), which sometimes overlap. Environmental justice is most often concerned with impacts to already overburdened communities, while energy justice is concerned with providing all individuals, across all areas, with safe, sustainable, and affordable energy.[55] Energy justice is focused on energy systems, and is often less retrospective than environmental justice.[56] However, in some formulations energy justice also has multiple dimensions, which may include energy access and affordability, procedural justice, economic participation and ownership, and health and environmental impacts.[57] Climate justice deals with the global justice implications that reflect the consequences of climate change. It focuses on assisting those most affected by climate change – often communities that have contributed less to the problem, and includes mitigation and reduction of greenhouse gas emissions, as well as adaptation and resilience.[58]

Four Dimensions of Environmental Justice

Practitioners and scholars have identified several critical dimensions of environmental justice:[59]

- distributive justice
- procedural justice
- recognition justice (or equal recognition)
- restorative justice.[60]

October 2021. https://www2.illinois.gov/epa/topics/environmental-justice/Pages/ej-policy.aspx.

53 Massachusetts Climate Roadmap Law, 2021 Mass. Acts 8. https://malegislature.gov/Laws/SessionLaws/Acts/2021/Chapter8.

54 New Jersey's Environmental Justice Law, N.J. Stat. Ann. 13:1D-157.https://www.nj.gov/dep/ej/docs/ej-law.pdf.

55 McCauley, Darren; Heffron, Raphael J.; Stephan, Hannes; Jenkins, Kristen. "Advancing energy justice: the triumvirate of tenets," *International Energy Law Review*, January 2013). https://www.researchgate.net/publication/259459020_Advancing_Energy_Justice_The_triumvirate_of_tenets

56 Jenkins, "Setting energy justice apart from the crowd: Lessons from environmental and climate justice."

57 Lanckton, Talia; DeVar, Subin. "Justice in 100 metrics: Tools for measuring equity in 100% renewable energy policy implementation," Initiative for Energy Justice, January 2021. https://iejusa.org/wp-content/uploads/2021/03/Justice-in-100-Metrics-2021.pdf. *See also* EPRI, "Measuring Energy Justice," May 2022. (metrics to measure energy equity).

58 McCauley, Darren; Heffron, Raphael J. "Just transition: integrating climate, energy, and environmental justice," *Energy Policy,* Vol. 119, August 2018, pp. 1–7. https://research-repository.st-andrews.ac.uk/bitstream/handle/10023/17583/McCauley_2018_EP_JustTransition_AAM.pdf?sequence=1&isAllowed=y

59 Kuehn, "A Taxonomy of Environmental Justice." (distributive justice, procedural justice, corrective justice, social justice); Finley-Brook, Mary; Holloman, Erica. "Empowering Energy Justice," *International Journal of Environmental Research and Public Health,* Vol. 13, no. 9, September 2016, p. 926. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5036759/ (distributive justice, procedural justice, recognition justice); McCauley, Heffron, Stephan, Jenkins, "Advancing energy justice: the triumvirate of tenets." (same); Tarekegne, Bethel; O'Neil, Rebecca; Twitchell, Jeremy. "Energy Storage as an Equity Asset," *Current Sustainable/Renewable Energy Reports*, Vol. 8, no. 3, May 20, 2021, pp. 149–155. https://link.springer.com/article/10.1007/s40518-021-00184-6 (distributive, recognition, procedural, restorative); "Equity and Environmental Justice Considerations for a Clean Energy Transition," EPRI, April 2021. 3002021206 (identifies "distributive justice (fair allocation of resources) and procedural justice (fairness in the processes that allocate resources)" as important environmental justice elements in the broader transition toward decarbonization of energy systems.)

60 "Justice40 Initiative Environmental Justice Fact Sheet," U.S. Department of Energy, Office of Economic Impact and Diversity, 2022. https://www.energy.gov/

When engaging in a project with potential environmental justice implications, understanding and applying these four dimensions is important. Doing so can help ensure the effective integration of environmental justice concerns into the project's decision-making process. It is important to understand these as distinct, because a good faith effort to address only one or two of these dimensions may still lead to misunderstanding or conflict because of differences in perception between the affected communities and the energy developers/operators. Scholars have found that paradigmatic differences and mismatches of approach often exist between environmental justice advocates and environmental professionals operating within their professional competencies.[61]

Distributive Justice

Distributive justice encompasses the equal distribution of not only the burdens but also benefits of actions, projects, programs, and policies.[62] Distributive injustices can occur regardless of whether the decision or process that caused it was discriminatory.[63] Underlying structural inequities directly contribute to the unequal distribution of harms among communities less equipped to resist them. A goal of distributive justice is to lower the risks of environmental hazards as well as to ensure that risks are fairly distributed.[64] Although the elimination of all risks is impossible, focusing on reducing an action's overall risk can ease the responsibility of ensuring the risk's equal and equitable distribution.

A good first step is a concerted effort to recognize structural biases that can contribute to an uneven distribution of risks and harms. Second, respectfully and meaningfully engaging communities in decision-making and community-based research is an important way to identify pressing local needs.[65] Third, based on that input, projects can seek consensus on how to best distribute benefits, such as through urban revitalization, creation of jobs, energy affordability, etc.

Procedural Justice

Procedural justice is defined as the right to equal opportunity to participate in political or other decision-making processes relating to the distribution of benefits and opportunities.[66] Its focus centers on the fairness of the decision-making process rather than its outcome. Meaningful engagement or involvement early and often in the decision-making process is the most important element of procedural justice.[67] In general, procedural justice has two main considerations:

- whether the avenues for public engagement promote equal participation (or do they favor one group or set of interests vs. others?)
- whether the decision equally considered all concerns.

The EPA has recognized that the public participation processes established in laws and policy are usually not enough to ensure meaningful involvement from low-income, minority communities, tribes, and indigenous peoples.[68] Meaningful involvement often requires unique efforts to connect with communities that have historically been underrepresented in decision-making and that have varying levels of education, literacy, or proficiency in English.[69] It also involves an acknowledgement that there might be a trust gap or an overlying bad perception due to previous lived experiences that require finding ways to achieve common ground. For example, this could include partnering with trusted local community organizations that can help identify local needs and priorities.[70] Equal access to information (including accessible resources), communication channels, and transparency during the process are also fundamental to providing equal footing in the decision-making process.

Furthermore, the processes employed, including regulatory and permitting processes, should lead to due consideration of concerns of affected communities. This includes ensuring that the process does not just favor opinions that are expertise-oriented, or from sectors that have more resources and political power than their low-income and minority peers.[71] Bias in favor of scientific data excluding other forms of local or cultural knowledge and values can also implicitly negate meaningful community participation. Of course, even if a process is procedurally even-handed, that does not necessarily ensure that the outcome will be perceived as fair. Mutual agreement on the model used for decision-making is often as important as the involvement of all of those affected by the decision.[72]

sites/default/files/2022-07/Environmental%20Justice%20Explainer%207_25_22.pdf; Tarekegne, O'Neil, Twitchell, "Energy Storage as an Equity Asset."
61 Finley-Brook, Holloman, "Empowering Energy Justice," p. 926.
62 Kuehn, "A Taxonomy of Environmental Justice."
63 Kuehn, "A Taxonomy of Environmental Justice."
64 Kuehn, "A Taxonomy of Environmental Justice."
65 *See generally* Finley-Brook, Holloman, "Empowering Energy Justice," p. 926.
66 Kuehn, "A Taxonomy of Environmental Justice."
67 Kuehn, "A Taxonomy of Environmental Justice."
68 *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*, p. 33.
69 *Guidance on Considering Environmental Justice During the Development of Regulatory Actions*, p. 33.
70 "Equity and Environmental Justice Considerations for a Clean Energy Transition."
71 Kuehn, "A Taxonomy of Environmental Justice."
72 *See generally* Kuehn, "A Taxonomy of Environmental Justice."

Recognition Justice

Recognition justice is deeply intertwined with procedural justice. Some typologies combine these concepts; however, recognition justice involves other important elements. It is defined as the affording of respect and consideration for individuals, communities, and their concerns, in a way that treats them on a par with dominant or politically powerful groups or institutions. Recognition injustices are experienced as "the process of disrespect, insult, and degradation that devalues" some people and some places in comparison to others.[73] It manifests not only as a failure to recognize others, but also implicitly by shutting down arguments and failing to actively listen to concerns.[74] It is also the explicit or implicit expectation people will assimilate to a majority or dominant cultural norm (for example, providing only English communication channels and resources to a majority non-anglophone community). [75] Recognition justice involves, but it is not limited to, recognizing explicit or implicit community leaders (such as religious leaders), cultural norms, beliefs, and awareness of past lived experiences that created bad perceptions and/or a lack of trust. Communities and stakeholders must be fairly represented, afforded equal political rights, and be free from physical threats. Failure of recognition can deepen a lack of trust and resistance within environmental justice communities.[76] Equal respect and consideration in the decision-making process involve recognizing that low-income populations and minorities are important sources of knowledge and solutions.[77]

Restorative Justice

Restorative justice calls for the reparation of harm. It not only includes accounting for present and future harms, but also ameliorating "situations that disenfranchised or harmed communities in the past."[78] It embodies the creation of "opportunities to improve environmental and social conditions within communities, including job and enterprise creation, as well as remediation of legacy pollution."[79] The main goal of restorative environmental justice is restoring a community's economic and social viability and environmental quality.[80]

Originally, restorative justice stemmed from the concept of not only imposing consequences on those who create harm, but also a duty to repair the losses.[81] But over time, that concept has expanded to include *past, present,* and *future* considerations.[82] While a newly proposed renewable energy or battery storage project (or its sponsoring company) may not be responsible for previous harms, it can be very helpful to take these into account in designing outreach, determining community concerns, and providing benefits that may address these, at least in part.

Acknowledging past harms that certain communities experienced due to racial and social oppression, divestment, disenfranchisement, and structural racism is central to how they may experience current activities. In communities where environmental injustices are common, even a project with positive outcomes could be perceived as another attempt to exploit the community.[83] When this acknowledgment and recognition of past problems exists, it can facilitate the development of solutions that address specific issues. Present-day solutions that are proposed can strive to help disenfranchized communities gain equal footing with communities that have not experienced such setbacks. This need not be an imposed process, but rather focus on developing respectful relationships, building trust, and empowering communities to design how they want to move forward (capacity building, creation of jobs, access to education, access to clean natural resources, affordable energy, other incentives).[84] Restorative justice also includes putting in place preventive and strategic actions to stop or mitigate future harms (resiliency) stem-

73 McCauley, Heffron, Stephan, Jenkins, "Advancing energy justice: the triumvirate of tenets."
74 McCauley, Heffron, Stephan, Jenkins, "Advancing energy justice: the triumvirate of tenets."
75 Fraser, Nancy. "Social justice in the age of identity politics: Redistribution, recognition, participation," WZB Discussion Paper No. FS I 98-109, 1998. https://www.econstor.eu/bitstream/10419/44061/1/269802959.pdf
76 McCauley, Heffron, Stephan, Jenkins. "Advancing energy justice: the triumvirate of tenets."
77 Finley-Brook, Holloman, "Empowering Energy Justice," p. 926.
78 McCauley, Heffron, "Just transition: integrating climate, energy, and environmental justice," pp. 1–7; *citing* Dorsey, Joseph W. "Restorative Environmental Justice: Assessing Brownfield Initiatives, Revitalization, and Community Economic Development in St. Petersburg Florida," *Environmental Justice Journal,* Vol. 2, no. 2, June 17, 2009. https://doi.org/10.1089/env.2008.0546
79 "Justice40 Initiative Environmental Justice Fact Sheet," U.S. Department of Energy, Office of Economic Impact and Diversity
80 Dorsey, "Restorative Environmental Justice: Assessing Brownfield Initiatives, Revitalization, and Community Economic Development in St. Petersburg Florida."
81 Kuehn, "A Taxonomy of Environmental Justice."
82 "Equitable Solar Policy Principles," NAACP, Spring 2021. https://naacp.org/resources/equitable-solar-policy-principles ("Open and inclusive solar policymaking must address past, current, and future impacts of pollution on frontline and BIPOC communities.")
83 Dorsey, "Restorative Environmental Justice: Assessing Brownfield Initiatives, Revitalization, and Community Economic Development in St. Petersburg Florida."
84 Dorsey, "Restorative Environmental Justice: Assessing Brownfield Initiatives, Revitalization, and Community Economic Development in St. Petersburg Florida."

ming from the project itself or from events such as climate change or disinvestment.

How Can Environmental Justice Communities Be Identified?

In determining how and whether to apply environmental justice practices when developing a renewable energy or battery energy storage project, it is helpful to define some of the kinds of communities and community settings where these practices may be expected, required, or particularly useful.

Federal and state definitions and methodologies can be informative. For example, if a project developer needs a federal permit or is operating in any of the states that have adopted environmental justice laws and/or policies, or if it is relying in part on funding tied to specific environmental justice laws and programs, then some of these would directly apply. In addition, such methods may also be highly informative as developers seek to design their own environmental justice strategies – even if not driven by external requirements.

Federal Definitions

Executive Order 12898 committed federal agencies to evaluate the impacts of their own programs, policies, and activities on "minority populations and low-income populations." The Order did not provide definitions to help agencies identify such populations or their communities. However, the federal Interagency Working Group charged with carrying out the Order provided definitions, which are appended to the Council on Environmental Quality's 1997 *Guidance on Environmental Justice*:[85]

> **Minority population:** Minority populations should be identified where either:
>
> (a) the minority population of the affected area exceeds 50% or
>
> (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.
>
> Agencies, in identifying minority communities, may consider a community to be either a group of individuals living in geographic proximity to one another, or a geographically dispersed/transient set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect. Selecting the appropriate unit of geographic analysis may be the jurisdiction of a governing body, neighborhood, census tract, or other similar unit that is to be chosen to not artificially dilute or inflate the affected minority population. A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds.[86]
>
> **Low-income population:** Low-income populations in an affected area should be identified using the annual statistical poverty thresholds from the Bureau of the Census' Current Population Reports, Series P-60 on Income and Poverty. In identifying low-income populations, agencies may consider a community to be either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or Native Americans), where either type of group experiences common conditions of environmental exposure or effect.

In 2016, 17 federal agencies published "Promising Practices for EJ Methodologies in NEPA Reviews,"[87] explaining their current and updated practices in applying these determinations. In 2019, the same Interagency Working Group released an accompanying document that explains how communities can understand and use these definitions when interacting with federal agencies.[88] These resources suggest how federal agencies engaged in environmental impact review may currently identify relevant communities. Energy developers may choose another approach if these are not directly applicable or are insufficient for planning and outreach purposes.

85 CEQ, Environmental Justice Guidance Under the National Environmental Policy Act (1997), Appendix A. https://www.epa.gov/sites/default/files/2015-02/documents/ej_guidance_nepa_ceq1297.pdf

86 The same document defines "minority" as "individual(s) who are members of the following population groups: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic. Id. Subsequent federal resources distinguish Asian from Native Hawaiian or Other Pacific Islander people, and highlight additional federal responsibilities applicable to indigenous peoples and tribes.

87 *Promising Practices for EJ Methodologies in NEPA Reviews*, NEPA Committee and Environmental Justice Interagency Working Group, February 2016. https://www.epa.gov/sites/default/files/2016-08/documents/nepa_promising_practices_document_2016.pdf (see chapters "Identifying Minority Populations" and "Identifying Low-Income Populations).

88 *Community Guide to Environmental Justice and NEPA Methods*, Environmental Justice Interagency Working Group, March 2019. https://www.energy.gov/sites/prod/files/2019/05/f63/NEPA%20Community%20Guide%202019.pdf (see chapters "Identifying Minority Populations" and "Identifying Low-Income Populations").

Promising Practices suggests that agencies (and by implication permit applicants) work with communities to identify appropriate geographic areas for analysis so that "small areas with concentrated minority populations are not overlooked" in a broader or regional analysis. Among the techniques some agencies use is a "no-threshold" analysis to identify *all* minority populations in an affected area, to understand and interact with such communities *whether or not* they exceed either a 50% threshold or consist of a percentage higher than the "general" population or the population of a comparative "reference area." Site-specific actions may often require more targeted understanding than county-wide or regional demographics. Similarly, for low-income communities, it may be helpful to understand groups or to identify particular census tracts where incomes are different from those of a wider geographic distribution.

In a related context, Biden Administration Executive Order 14008, "Tackling the Climate Crisis at Home and Abroad," directed the Council on Environmental Quality to develop a geospatial mapping tool identifying "disadvantaged communities."[89] These are described elsewhere in the Order as "historically marginalized and overburdened by pollution and underinvestment."[90] The new federal "Justice 40" initiative seeks to have 40% of the "benefits" of certain new federal investments flow to such disadvantaged communities.[91] The Climate and Economic Justice Screening Tool (CEJST), under development by federal agencies, uses environmental and climate indicators together with socioeconomic indicators to identify such communities at the census tract level. The initial version of the CEJST does not use race as an indicator of "disadvantaged," choosing instead to combine an environmental or climate indicator with a socioeconomic indicator (such as income/poverty level and education).[92]

While governmental entities have legal concerns with the extent to which race may be used explicitly as a category for federal investment decision-making, for both analytical and community relations purposes it can be helpful for project developers to fully understand the demographics of communities that may experience impacts.

Mapping and Screening Tools

The U.S. EPA has developed EJSCREEN, a publicly available online tool to aid in discerning both environmental and sociodemographic data at the census block group level, using publicly available data sets. While EJSCREEN does not itself define an "EJ Community," it can assist federal agencies, project developers, and others to discern key characteristics to consider. More than a dozen states have their own screening tools in place or under development that can also assist in identifying communities and existing impacts.[93] EPRI prepared a brief compilation of the indicators used in many of the state and federal screening tools in 2022. It highlights the array of demographic/socioeconomic indicators and environmental/health/exposure indicators that have been considered in each of these tools.[94] Accurately identifying and understanding the characteristics of disadvantaged and overburdened communities that potentially experience disproportionate environmental harms and risks is critical for advancing environmental justice.

State Definitions

States have developed definitions that describe relevant environmental justice communities for various purposes. These may inform renewable energy and battery storage project developers seeking a way to define such communities. Recognizing that understanding and addressing environmental justice is evolving, the following examples are not exhaustive.

New Jersey's environmental justice law defines "overburdened community" and directs the New Jersey Department of Environmental Protection (NJDEP) to publish a list of such communities for use under the law. It defines "overburdened community" as any census block group, as determined in accordance with the most recent United States Census, in which:

- at least 35% of the households qualify as low-income households
- at least 40% of the residents identify as a minority or as members of a State-recognized tribal community
- at least 40% of the households have limited English proficiency."[95]

89 86 Fed. Reg. 7619 (Feb. 1, 2021), Section 222.
90 86 Fed. Reg. 7619 (Feb. 1, 2021), Section 219.
91 86 Fed. Reg. 7619 (Feb. 1, 2021), Section 223.
92 *Climate and Environmental Justice Screening Tool*, Council on Environmental Quality, 2022. https://screeningtool.geoplatform.gov/en/methodology.

93 Grier, Laura; Mayor, Delia; Zeuner, Brett; Mohai, Paul. "Community Input on State Environmental Justice Screening Tools," *Environmental Law Reporter*, Vol. 52, June 2022, pp. 10441–10442. https://www.elr.info/sites/default/files/files-general/52.10441.pdf States with screening tools include California, Colorado, Connecticut, Illinois, Indiana, Maryland, Massachusetts, Michigan, Minnesota, Missouri, New Jersey, New Mexico, New York, North Carolina, Pennsylvania, Virginia, Washington, and Wisconsin. Many of these are modeled on California's CalEnviroScreen tool.
94 *Program on Technology Innovation: Update on Environmental Justice Overview—Mapping Tools and Metrics*, EPRI, April 2022. https://www.epri.com/research/products/000000003002023064
95 NJ. Stat. C.13:1D-158.

Massachusetts' environmental justice policy defines an "Environmental Justice (EJ) Population" as

- "a neighborhood that meets 1 or more of the following criteria: (i) the annual median household income is not more than 65% of the statewide annual median household income; (ii) minorities comprise 40% or more of the population; (iii) 25% or more of households lack English language proficiency; or (iv) minorities comprise 25% or more of the population and the annual median household income of the municipality in which the neighborhood is located does not exceed 150% of the statewide annual median household income; or
- a geographic portion of a neighborhood designated by the Secretary as an environmental justice population in accordance with the law."[96]

Massachusetts also defines "Vulnerable Health EJ Populations" as segments of the population that have evidence of higher than average rates of environmentally-related health outcomes, including but not limited to childhood asthma, low birth weight, childhood lead poisoning, and/or heart disease morbidity."[97]

New York's Climate Leadership and Community Protection Act requires that state programs advancing renewable energy and storage projects provide "substantial benefits for disadvantaged communities, as defined in article 75 of the environmental conservation law, including low to moderate income consumers," and also prescribes that such communities receive set percentages of the "benefits" of state spending on "clean energy and energy efficiency programs."[98] Draft criteria for identifying "disadvantaged communities" were released for public review in 2022, and consist of 45 indicators, which include climate risks such as flooding or extreme heat, health vulnerabilities, and socio-economic factors including race, ethnicity, and income.[99]

Colorado's Environmental Justice Act defines "disproportionately impacted communities" as any census block groups with more than 40% low-income households, more than 40% people-of-color households, or more than 40% housing-cost-burdened households (spending more than 30% of income on housing); as well as any other community identified or approved by a state agency if: the community has a history of environmental racism perpetuated through exclusionary laws (including redlining, anti-Hispanic, anti-Black, anti-indigenous, and anti-immigrant laws), or where multiple factors (socioeconomic stressors, disproportionate environmental burdens, vulnerability to environmental degradation, and lack of public participation) cumulatively contribute to persistent public health and environmental disparities.[100]

Practical Approaches to Identifying Environmental Justice Communities

Socio-demographic characteristics may help developers identify relevant communities. Among the factors that companies have used, along with available screening tools, are the extent to which a defined community or population that a project could potentially affect can be characterized as:

- Low-income (under various measures)
- Meaningful number of Black, indigenous, people of color (BIPOC) residents
- Linguistically isolated/fewer speakers of English
- Educational differences/fewer years of education
- Unemployment higher than comparison communities
- Historic loss of employment/employers
- Preponderance of poor health indicators
- Lower life expectancy
- Lower median home values

Environmental characteristics also can suggest environmental community concerns:

- Substandard housing conditions (lead paint, lead water service lines, lack of energy efficiency, poor construction/maintenance)
- Overburdened by exposures to pollution/pollutant releases

96 "ENVIRONMENTAL JUSTICE POLICY OF THE EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS," Massachusetts, June 24, 2021. https://www.mass.gov/doc/environmental-justice-policy6242021-update/download.

97 "ENVIRONMENTAL JUSTICE POLICY OF THE EXECUTIVE OFFICE OF ENERGY AND ENVIRONMENTAL AFFAIRS." The Secretary may designate a neighborhood if "a geographic portion of that neighborhood meets at least 1 criterion... upon the petition of at least 10 residents of the geographic portion of that neighborhood meeting any such criteria; provided further, that the secretary may determine that a neighborhood, including any geographic portion thereof, shall not be designated an environmental justice population upon finding that: (A) the annual median household income of that neighborhood is greater than 125% of the statewide median household income; (B) a majority of persons age 25 and older in that neighborhood have a college education; (C) the neighborhood does not bear an unfair burden of environmental pollution; and (D) the neighborhood has more than limited access to natural resources, including open spaces and water resources, playgrounds and other constructed outdoor recreational facilities and venues." Mass. Gen. Law, 30, section 62.

98 N.Y. Env. Cons. Law 75–117, N.Y. Pub Serv. Comm. Law 66

99 "Draft Disadvantage Communities Criteria," N.Y. Climate Justice Working Group, 2022. https://climate.ny.gov/DAC-Criteria

100 Colo. Rev. Stat. 24-4-109 (2022).

- Proximity to waste facilities with actual or potential releases (landfills, incinerators, sorting/recycling facilities)
- Deficits in public services/public infrastructure (water, wastewater, solid waste, public safety)
- Vulnerability to flooding, climate change, other environmental hazards.

In general, it is likely that renewable energy and battery storage system developers may be dealing not with a single community, but with *communities* (plural). Even demographically similar communities are not monolithic. It is important to understand both differences and commonalities. For example, one portion of an African American community may consist of mostly highly educated and newer residents who own their own homes, while another portion may include longtime residents with less education but longer roots in the area (including its institutions), while yet another portion may include recent immigrants from abroad. These communities are likely to have varying concerns, histories, interests, and capacities for engagement (even though superficially, based on census data, the area may appear as a single racially defined community).

At the same time, different demographically defined groups may share common concerns, such as the effect of ongoing or historic pollution, lack of transportation and access to well-paying jobs, or patterns of public and private disinvestment. For these reasons, it can be most helpful to look at multiple indicators and to understand commonalities as well as differences that may affect how a proposed project is received.

Potential Concerns of Environmental Justice Communities

While from an industry and climate perspective, new renewable facilities and battery storage systems may produce more substantial benefits than fossil fuel electric power generation, it is still necessary to identify and address meaningful community concerns using methods that reflect a commitment to environmental justice. "The basic compatibility between a transition toward greater reliance on renewable energy and environmental justice does not preclude conflicts at the project level, nor does it absolve policymakers of the need for sensitivity to the potential implications of policy design features promoting renewable resources."[101]

This section identifies common community concerns associated with utility-scale or large-scale solar, wind, and battery storage projects. It is based on issues commonly raised with respect to such projects, as well as on industry and public fact sheets and assessments. After listing these common concerns, the paper highlights ways in which environmental justice considerations may affect or enhance these potential concerns.

Potential Community Concerns

All Facilities

- Visual impacts
- Noise impacts
- Effect on property values
- Siting on or in proximity to areas of specific importance
- Destruction of natural areas/ wildlife habitat
- Loss of farmland (or limitation on use)
- Interruption to local lifeways
- Job loss or displacement
- Effect on tourism, recreation
- ELF EMF concerns
- Impacts during construction
- Public safety/emergency response
- Decommissioning and end-of-life management of materials
- Lack of community engagement in planning processes
- No direct electric power benefits from energy facility
- Site security/access/community coordination
- Chemical leaks of fire suppressant or HVAC fluid

Solar Generation

- Glare/reflection from panels
- Runoff from impervious surfaces/de-vegetation
- Temperature/heat
- Dust
- Materials in panels

Wind Generation

- Health Impacts – migraines, sleep loss, aural disturbances
- Shadow flicker
- Tower or blade failure
- Ice throw
- Impact on bird and bat populations
- Impact of offshore wind on fisheries, navigation, use of coastal lands

Battery Storage Systems

- Fire/explosion risk
- Air quality impacts of fire/ explosion risk
- Hazardous materials

It is important to note that environmental justice communities may have many of the same concerns as non-disadvantaged, non-minority communities. Issues such as visual impacts, large industrial facilities occupying farmland, or concerns about traffic, safety, or water quality impacts can worry any community. Effective prepara-

101 Outka, Uma. "Environmental Justice Issues in Sustainable Development: Environmental Justice in the Renewable Energy Transition," Journal of Environmental and Sustainability Law, Vol. 19, Issue 1, Article 5, Summer 2012, pp. 60, 75. https://scholarship.law.missouri.edu/jesl/vol19/iss1/5

tion requires that project developers recognize the four dimensions of environmental justice in addressing even common concerns in communities that have been disadvantaged in ways that characterize them as environmental justice communities.

Communities that have experienced substantial burdens in the past may have different questions and expectations relating to the impacts of new facilities than communities without such experiences. For example, when a project is proposed in an area with a history of prior or ongoing polluting industries, the fact that the proposal is for a non-fossil fuel activity may still not make it a welcome addition. Such communities may have additional concerns rooted in their self-identification, cultural and historical traditions, and even differences in understanding of justice and meaningful engagement in decision-making.

These concerns can be amplified within environmental justice contexts in a variety of ways:

Adverse effect on property values. Homeownership is a significant source of wealth and security for many Americans, and in many environmental justice communities it may constitute the only meaningful asset a family or individual holds. Thus, some environmental justice communities may perceive a proposed energy facility as merely another instance in a long history of housing discrimination (including redlining, predatory lending, and lack of access to funds for repair and maintenance) that prevented access to the fullest benefits of homeownership. Where housing stock is already in substandard condition, the prospect of a local use potentially depressing values even further may suggest an exploitation model of development – and consequently the conversations about the project will need to be different than they'd be in a community that does not have that history. Project developers may need to understand that property value studies might not be persuasive in this context, meaning the developers may need to evaluate alternative approaches with the community, including considering actions (including governmental actions) that can add value and stability.

Impact on cultural, historic, religiously important sites. There may be projects where communities object to development based entirely or almost entirely on the significance of the site selected or affected by the selected site. A proposed wind farm or solar farm located on a sacred or cultural site for indigenous peoples, or impeding access to such a site, may raise opposition from affected tribes and members. A project site located in an area where a sensitive event occurred, such as areas that have experienced instances of historic violence and injustice, could generate objections from survivors or the descendants of those affected. For certain sites, such as burial grounds, the significance may be obvious; however, it may also be that the significance of these sites is well known only in the communities that find them important. Some tribal and indigenous communities have raised concerns with wind farms affecting viewsheds related to culturally important landscapes[102] or solar farms occupying or affecting culturally significant landscapes.[103] Some African American communities have expressed concerns related to longstanding occupancy of areas originally settled by ancestors who created the communities after the end of enslavement. These specific concerns raise issues that may need additional attention – over and above those that other communities might raise when faced with the same proposals.

Impact on sacred or significant cultural resources. While the site itself may not have special status, environmental justice communities may express concern if using the site could interfere with other significant values. North American Native American tribes and native Hawaiian communities have objected to past renewable energy project proposals for such reasons. For example, an indigenous community may object to a wind project if the members believe it will endanger a culturally valued bird or bat species, or if a solar farm is proposed for an area where a plant used in cultural or religious practices is gathered. In some instances, these values can be reconciled through changes in project design or operation.

Impact on agricultural continuity and tradition. Many solar and wind facilities are sited in rural areas, which are often lower income, primarily because of land availability, resource quality, and access to transmission.[104] In some of these areas, there may be substantial

102 See, e.g., *Quechan Tribe of the Fort Yuma Indian Reservation v. U.S. Department of the Interior*, 673 F. App'x 709 (9th Cir. 2016) (upholding BLM viewshed analysis and approval of wind farm); *PEER v. Beaudreau*, Case 1:10-cv-01067-RBW-DAR (D.D.C. 2014) (summary judgment for government on Wampanoag tribe's claims regarding evaluation of viewshed impacts of Cape Wind project). "Finding of Adverse Effect for the Vineyard Wind I Construction and Operations Plan" (Revised November 13, 2020), Bureau of Ocean Energy Management (BOEM). https://www.boem.gov/sites/default/files/documents/oil-gas-energy/Vineyard-Wind-Finding-of-Adverse-Effect.pdf (visual impact on Chappaquiddick Island Traditional Cultural Property)

103 *Quechan Tribe of the Fort Yuma Indian Reservation v. U.S. Department of the Interior*, 755 F. Supp. 2d 1104 (S.C. Cal. 2010) (granting preliminary injunction for inadequate consultation with tribe).

104 O'Shaughnessy, Eric; Wiser, Ryan; Hoen, Ben; Rand, Joseph; Elmallah, Salma. "Drivers and energy justice implications of renewable energy project siting in the United States," *Journal of Environmental Policy & Planning,* July 2022. https://eta-publications.lbl.gov/sites/default/files/siting_drivers_and_justice_implications_preprint.pdf

concern that a large-scale industrial use will take at least some lands out of agriculture, and could damage the local agricultural economy, which depends on multiple farmers' collaboration. Historic African American farming communities, Hispanic farming communities, and Native American farming communities may have additional reasons to be concerned about continuity, and keeping access to farming supplies and markets, not only because of their longstanding ties to the land, but also as many have suffered a history of marginalization and discrimination that has severely stressed their ability to continue farming. Many of these communities have suffered from intentional discrimination and lack of access to government loan programs, markets, and technical assistance. Particularly in communities that continue to practice agriculture despite significant hardships (e.g., former sharecropping communities, communities on reservations, or communities of immigrants or refugees who farmed in their countries of origin) agricultural livelihoods may have added significance. These communities may rely on the continuance of agriculture not only for livelihoods but also to access culturally relevant foods or traditional lifeways.[105]

Job loss or employment transition. Depending on where the project is being sited and the type of project, communities may worry about the possibility of job loss. In agricultural communities, there may be concerns about losing farming jobs. Similarly, ranching communities may have questions about whether land will continue to be available for grazing and how this could affect local livelihoods. In areas where the local economy relies on tourism, communities may raise concerns that a proposed project may impact the area's natural appeal, hurting tourism and leading to a loss of jobs in that industry. If a proposed renewables project does not provide any (or many) lasting jobs, the community may regard the proposal as another instance of disinvestment in the local workforce, even though the facility itself represents an investment by the project proponent. Concern about employment impacts is contextual but may not be entirely discernable from statistics alone – in large part this can be due to the availability or lack of other opportunities.[106]

Fishing and coastal resource dependency. In areas with offshore wind development, communities connected to fishing, whether through employment or for cultural reasons, may also have concerns that include possible effects on livelihoods. For example, Black and Vietnamese fishing communities along the coast of the Gulf of Mexico rely on fishing for livelihoods and the ability to maintain their communities. Numerous Native American tribes exercise fishing rights in various coastal waters of the United States, and Alaska natives have significant subsistence rights. Indigenous treaty rights may also include expectations and guarantees about access to lands and to fish and wildlife resources; these can apply even where the lands are not owned by a tribe and are causes for concern if access to them is potentially threatened by proposed power generation uses. Protecting access across project lands may also need to be assured for such reasons.[107] In sum, environmental justice communities' connection to fish and wildlife resources (and to coastal lands for shellfish harvest and other purposes) may create substantial issues that present themselves differently.

Health impacts. Environmental justice communities may already face disproportionate environmental health burdens, as well as a lack of access to health care. It is important to consider these factors even though they may seem negligible. This includes any changes in external environmental conditions that may concern a community. For example, communities may worry about dust from construction and possible respiratory impacts. Depending on where in the county the project is sited, there may be specific environmental concerns. For example, communities in the American southwest may raise concerns about the fungus that causes valley fever becoming airborne during the construction process. Concerns may also be related to the specific type of infrastructure being proposed. Environmental justice communities may worry, for example, that large solar farms will create heat or generate a heat island effect, especially in areas without reliable air conditioning and without affordable energy bills. Communities with underlying health issues may also have significant concerns related to quality of life impacts, and express concerns about the noise impacts of facilities, or the impacts of shadow flicker or glare, that may initially be more difficult to address because of the existence of other stressors, and the lack of trusted medical communicators.[108]

105 Melissa, Jean. "The Role of Farming in Place-Making Processes of Resettled Refugees," *Refugee Survey Quarterly*, Vol. 34, 2015; Noble Maillard, Kevin. "On Remote Farms and in City Gardens, a Native American Movement Grows." *The New York Times*, August 26, 2022. https://www.nytimes.com/2022/08/26/dining/native-american-agriculture.html

106 Cha, J. Mijin; Price, Vivian; Stevis, Dimitris; Vachon Todd E.; Brescia-Weiler, Maris. *Workers and Communities in Transition: Report of the Just Listening Project*, 2021. https://www.labor4sustainability.org/files/JTLP_report2021.pdf

107 Kronk Warner, Elizabeth Ann. "Tribal Treaty Rights: A Powerful Tool in Challenges to Energy Infrastructure." *Connecticut Law Review*, 425, 2019. https://opencommons.uconn.edu/law_review/425/

108 "Environmental Racism Collection: Exposure and Health Inequities in Black Americans." National Institutes of Health, *Environmental Health Perspectives,* 2020. https://ehp.niehs.nih.gov/curated-collections/environmental-racism; "Indigenous Health Collection." National Institutes of Health, *Environmental*

Urban areas and brownfields. Battery storage systems not co-located with utility-scale solar or wind facilities may be sited in urban areas, including on brownfield sites, or be co-located with existing energy infrastructure such as substations. Communities in these areas may have already experienced adverse effects of lower property values, environmental exposures, or abandoned facilities from previous industrial uses. Many communities, underserved or not, may want guarantees for state-of-the-art safety mechanisms, community alert systems, and rapid responses in the case of a fire or other failure event. The environmental justice concerns for battery storage systems are likely to mirror concerns that would be raised in response to any industrial facility. However, environmental justice communities may be proportionately more concerned about fire risk and the risk of emissions from runaway thermal reactions than other communities if an area has been historically neglected by first responders. Residents of environmental justice communities with limited resources may have additional questions concerning the aftermath of a fire: Who would bear the cost of reconstruction if a fire were to occur? What kind of community monitoring and cleanup could be counted on? In environmental justice communities that already bear disproportionate burdens, members might worry about these possibilities but could express these concerns in ways that are not always heard the same way by siting professionals focused on technical issues.

Decommissioning. Many environmental justice communities have long histories in particular places; residents or workers there may have seen many facilities and governmental officials come and go as time passed. There is likely to be substantial concern by these communities about the eventual decommissioning and end-of-life management of materials used at a facility. This is likely to be particularly important given environmental justice communities' frequent history of exposures to pollutants, and their experience of companies previously operating without due care or investment in protecting their communities. Communities may have experience with abandoned or derelict facilities, which could pose health and safety hazards. Communities are likely to seek answers, and even guarantees, related to these concerns. Inquiries may include whether there are any hazardous substances in the technology that need to be dealt with in specific ways; plans for the infrastructure at the end of the project; and what guarantees and assurances the community has. If a facility will be operational for 30 years, but there is not an initial guarantee at the outset of proper disposal at the end of the project, or there is not a clear source of funding for proper decommissioning, the facility could become or be perceived as a safety hazard. Similar issues arise with respect to site security and the effect on vulnerable members of the community, including minors, during the operational life of the facility.

Lack of sharing in economic benefit. Lack of any economic benefit (such as no concomitant increase in energy reliability or lowering of electric bills) can lead to communities seeing a planned project as creating burdens with no benefits. Low-income households spend a higher percentage of their income on energy,[109] and frequently have additional stressors making the need for energy even more critical.[110] In a situation where residents of a community are already struggling with high energy bills, low employment, and substandard housing, the production of energy for another (distant) user is likely low on their list of values and priorities. Even in situations where the energy generated by the renewable or storage facility goes directly to the local grid, without a direct and significant reduction on residents' energy bills or other discernable improvement, a community may perceive that its needs remain unaddressed. There are ways to create these linkages (as discussed in the Community Benefits section below), but unless the concern is identified the opportunity to do so may be overlooked.

Integrating Environmental Justice into Renewable Energy and Battery Storage Projects

Incorporating environmental justice means giving careful attention to conducting meaningful engagement with environmental justice communities, identifying implementable mitigation strategies (including during siting, design, and operation), and identifying community benefits that are sufficiently related to the project to be implementable and responsive to community needs.

Meaningful Engagement

A key aspect of incorporating environmental justice into project-related decisions is "meaningful engagement" with the relevant com-

Health Perspectives, 2019. https://ehp.niehs.nih.gov/curated-collections/indigenous-health

109 Bednar, Dominic; Reames,Tony. "Recognition of and Response to Energy Poverty in the United States." *Nature Energy,* Vol. 5, 2020, pp. 432–439. https://doi.org/10.1038/s41560-020-0582-0

110 Tarekegne, O'Neil, Twitchell, "Energy Storage as an Equity Asset." p. 151; *Equity and Environmental Justice Considerations for a Clean Energy Transition*.

munities, the broad term used by the Federal Interagency Working Group on Environmental Justice.[111] For its part, the EPA has used the term "meaningful involvement," which it defines as having four dimensions, ensuring that:

- potentially affected populations have an appropriate *opportunity to participate* in decisions about a proposed activity that will affect their environment and/or health;
- the public's contribution *can influence* the decision;
- the concerns of all participants involved will be *considered* in the decision-making process; and
- the decision-makers *seek out and facilitate* the involvement of those potentially affected.[112]

The Solar Energy Industries Association *Policy Principles on Environmental Justice and Equity* commit their members to "consistent and meaningful engagement with environmental justice advocates and organizations that represent frontline and fenceline communities."[113]

Massachusetts defines the same term to mean that "all neighborhoods have the right and opportunity to participate in energy, climate change, and environmental decision-making including needs assessment, planning, implementation, compliance and enforcement, and evaluation, and neighborhoods are enabled and administratively assisted to participate fully through education and training, and are given transparency/accountability by government with regard to community input, and encouraged to develop environmental, energy, and climate change stewardship."[114]

It is important to recognize that meaningful engagement is different from simply holding public information sessions and providing an opportunity for feedback. While these are potentially part of a meaningful engagement strategy, companies may need to *seek out and facilitate* interactions with portions of the community or communities that might otherwise find it difficult to engage. Moreover, understanding community concerns can shape implementation activities in ways that address the concerns expressed.

Why Is Meaningful Engagement Important?

First, environmental justice communities are often accustomed to being affected by actions without much, if any, consultation or engagement. This history can engender negative expectations and can contribute to poor outcomes even if a new project intends to be more communicative and interactive than those of the past.

Second, many of these emerging and rapidly changing energy technologies present unknowns to communities of all kinds. This creates opportunities for resistance or suspicion based on lack of information, or even on misinformation. Meaningful engagement by project developers is critical to create real understanding and a factual basis for discussion.

Third, it is not safe to assume a community's interests or concerns. Not every community is like every other, and it is important to first listen, to understand, and to learn. The history and experiences of a community may be quite different than initially thought, or raise unexpected, but perhaps quite resolvable, issues.

Fourth, community members may have expertise that is invaluable to a project. For example, knowledge of information or resources relating to siting or cultural issues and an ability to identify respected and trusted community advisors and leaders that can assist may help to create inroads in the broader community or bring to the table real, workable mitigation strategies. Community members may be able to identify alternatives, solutions, or potential benefits that would not otherwise be identified (or accepted even if identified) by another.

Techniques useful for meaningful engagement

Meaningful engagement with communities can take many forms. Appropriate techniques for engagement include a range of actions. Different techniques may be best suited to various stages of a project.[115] Familiar strategies for consultation with a community include public comment periods, focus groups, community forums, and surveys. These types of strategies may be useful to acquire a basic understanding of a community in *the initial stages* of a project. As a project progresses, deeper involvement and collaboration with a community may include strategies such as house meetings, interactive workshops, polling, community forums, memorandums of understating with community-based organizations, citizen advisory

111 *Promising Practices for EJ Methodologies in NEPA Reviews*.
112 *Guidance on Considering Environmental Justice During the Development of Regulatory Actions.*
113 "Solar Industry Policy Principles on Environmental Justice & Equity," Solar Energy Industries Association, April 2022. https://www.seia.org/sites/default/files/2021-04/SEIA-Solar-Environmental-Justice-Platform-April2021.pdf
114 "Environmental Justice Policy of the Executive Office of Energy and Environmental Affairs," Massachusetts.
115 See, e.g., "Community Guide to Environmental Justice and NEPA Methods," Environmental Justice Interagency Working Group, p. 12 ("Characteristics of Meaningful Engagement").

committees, and participatory budgeting.[116] Regardless of the types of engagement utilized, there are several best practices for community engagement, detailed below.

- **Early consultation that is active, not reactive nor pro-forma.** Proactive consultation generates early awareness of potential concerns, which in turn allows developers to devise specific solutions. A number of energy companies have adopted corporate policies that include commitments for such activities. For example, Dominion Energy's updated policy says that the company will:
  - Perform environmental justice reviews of major infrastructure projects to identify potentially vulnerable communities early in the permitting process, thereby informing our project planning and leading to enhanced outreach efforts that solicit meaningful involvement from communities that might otherwise be unaware of or unable to participate in the planning process. Continue to engage with community stakeholders and proactive industry groups to continually improve our internal environmental justice review process and outreach strategies.
  - Engage with local communities, stakeholders, and customers on environmental issues important to them. When building projects, we will select sites and seek permits in a manner that allows for meaningful involvement of all people regardless of race, color, national origin, or income.[117]
- **Understand who from a community may have useful or important information.** Identify individuals who may have knowledge, as well as the respect of their communities. Coordinate with community-based organizations and develop a community profile together with such organizations. "The community profile can be developed in collaboration with the community in a two-way dialogue. The community's level of participation, interest, and understanding could be affected by literacy levels, numeracy levels, or disabilities, which might not show up in aggregated census or health data. It could be discoverable through direct engagement with community groups; however, it is important to know when a community prefers oral as opposed to written communication as well. It is also important to achieve a solid understanding of the community's perception of the benefits and costs of participating."[118]
- **Listen in order to learn.** It is not safe to make assumptions about who a community is or what its concerns may include. For example, when working with a community with a different cultural background, let that community explain the ways its culture or history has shaped possible concerns about a project. This can help avoid assumptions that either overlook a community's actual concerns or attribute concerns that do not actually exist within that community.[119]
- **Make a plan for meaningful engagement that includes follow-through, determining whether objectives are being met or whether the plan itself needs to be modified in order to be effective.** Solar developers participating in Virginia's workgroup on siting large solar facilities identified this as a key practice.[120] California's Department of Public Health advocates "planning for community participation by drawing on evidence-based guidelines that inform the remaining goals" to achieve a defined purpose.[121]
- **Format and design interactions that are based on the local community and that ensure accessibility.** Accessibility and inclusiveness encompass a variety of practices. This includes designing your interactions to ensure that even marginalized members of the relevant community can be included.
  - When planning the location and timing of an interaction, ensure that these occur in times and places that community members can easily participate. If many members of the community lack reliable internet service, an online forum or meeting may not be the best strategy. Similarly, take into consideration work and school schedules and cultural holidays or seasons when setting times for interactions.
  - Choose sites for information and discussion that are seen as welcoming to the community. Preferably consult with com-

116 "Engaging Communities For Health Equity and Environmental Justice: A Guide for Public Agencies," California Department of Public Health, 2021, p. 2. https://www.cdph.ca.gov/Programs/CCDPHP/DEODC/EHIB/CDPH Document Library/Guide-Engaging_Community_for_Health_Equity_and_EJ_ADA.pdf

117 "Dominion Energy Environmental Policy Statement," Dominion Energy, May 18, 2022. https://cdn-dominionenergy-prd-001.azureedge.net/-/media/pdfs/global/projects-and-facilities/electric-projects/power-line-projects/chesterfield-hopewell/corporate-environmental-policy.pdf.

118 *Engaging Communities*, p. 16.

119 "Community Engagement Guide," Washington State Department of Health, p. 15. https://doh.wa.gov/sites/default/files/legacy/Documents/1000//CommEngageGuide.pdf

120 See Comments by solar developer, "VNRLI Policy Action Workgroup on Solar Facility Siting," University of Virginia Institute for Engagement and Negotiations, App. 5, April 2021, p. 23. https://www.equitablecollaboration.org/uploads/1/3/5/0/135079436/policy_action_workgroup_on_solar_facility_siting_final_report.pdf

121 *Engaging Communities*, p. 11.

munity members on suitable locations that can be both effective and seen as neutral or safe spaces.

  - The way information is communicated is also critical to accessibility. In communities where residents speak languages other than English, ensure that translation or interpretation services are available for all communications with residents. Levels of literacy in first languages other than English may also determine whether translation or communication services would be more appropriate. Furthermore, English may not be appropriate as the dominant language depending on the type of interaction and the community involved.[122] If there are low levels of English proficiency, literacy, or numeracy in a community, ensure that written materials are understandable by that audience. This may mean stripping communication of some technical language, avoiding complicated grammatical structures, and ensuring that any images that are included are chosen carefully and will not be misinterpreted.[123]

  - Plan for interactions with the community, whether in in-person or online, that account for accessibility needs of individuals with a range of disabilities.[124] This is a critical element of effective engagement that incorporates recognition justice.

- **Employ techniques to build respect or trust (even when parties are not in agreement at various points).** This includes developing a reputation for honesty and truthfulness in communicating facts and developments, transparency when taking actions or seeking approvals, follow-through on commitments, and willingness to find information/expertise in response to community concerns.[125] It is also important for the project developer to be transparent "about the amount of power community perspectives hold in decision-making."[126] This approach avoids over-promising as well as perceptions of misleading, or of wasting a community's time in a meaningless exchange.[127]

- **Provide training/opportunities for community members to develop expertise and understanding.** Remember that while these renewable energy and battery storage technologies are familiar to the developer, and the technical issues and common impacts are studied and known, in most cases an environmental justice community will have had no previous exposure either to utility-scale renewable generation or battery storage systems. They need access to trustworthy sources of information that are not tied solely or directly to the project proponent or even the permitting authority; these sources may not begin with a presumption of credibility or even good intentions.

- **Ensure there are co-owned/developed safety plans and commitments on operation.** Wherever possible, seek buy-in by working together with residents on safety plans, communication plans, and commitments to the community that will be implemented during the life of the facility's operation. A community that has meaningful input into the aspects of an operation that will most directly interact with their lives may be more likely to accept both the facility and the adjustments that may need to occur from time to time. Such an approach is far better than an imposed plan or strategy that simply reflects a company's goals.

EPA's 2008 Collaborative Problem-Solving Model seeks to help communities address potential areas of improvement in environmentally burdened communities.[128] If employed, multi-stakeholder collaborations may include academia, non-governmental organizations, civic organizations, local governments, and other partners. Outside experts with experience in environmental justice can also provide historical context, as well as effective methods for identifying environmental justice communities; their engagement can lend legitimacy to a company's environmental justice efforts.

Even if the community has not been involved at the earliest stages of planning, it is important to start meaningful engagement as soon as possible, as this can still help lead to positive outcomes.

Mitigation Methods

Attention to project siting, design and operation can help a company plan to meet the requirements of distributive and restorative justice. It helps to recognize opportunities to address these dimensions when first scoping out a project proposal. Waiting until after site selection and design are complete or nearly complete to consider these issues may lead to unwelcome surprises and may constrain a company's ability to consider and implement effective alternative design options that may better suit the needs of the stakeholders.

122 *Engaging Communities*, pp. 51–53.
123 *Engaging Communities*, pp. 54–58.
124 *Engaging Communities*, pp. 59–61.
125 "Best Practices for Meaningful Engagement," Groundwork USA, 2018. https://groundworkusa.org/wp-content/uploads/2018/03/GWUSA_Best-Practices-for-Meaningful-Community-Engagement-Tip-Sheet.pdf
126 *Engaging Communities*, p. 11.
127 "Best Practices for Meaningful Engagement," Groundwork USA.

128 *EPA's Environmental Justice Collaborative Problem-Solving Model,* United States Environmental Protection Agency, June 2008. https://www.epa.gov/sites/production/files/2016-06/documents/cps-manual-12-27-06.pdf

Siting Approaches for Mitigation

The process of investigating and selecting potential sites for deploying energy technology offers many opportunities to understand not only the available natural resource (wind speed and frequency, solar resource, land availability), local ecosystem and habitats, and engineered systems (grid, access to interconnection), but also the demography and social history of a community. Taking advantage of environmental justice screening tools early in the process can help identify potential communities of concern as well as ways in which to anticipate and address objections.

While the industry's use of siting tools is well developed with respect to evaluating wind and solar resources, accessing transmission, and avoiding conflicts with endangered species or high biodiversity areas, there is now a substantial opportunity to pioneer sensitive siting in the context of environmental justice concerns.

New Jersey has developed a tool to aid developers planning solar PV projects, including utility-scale development, to identify lands where the NJDEP encourages solar development and lands where it discourages development.[130] While chiefly focused on environmental characteristics, preferring solar PV development in areas with existing impervious surfaces characteristic of urban areas, the tool was recently updated to incorporate additional characteristics. These presumably could consider changes such as New Jersey's environmental justice legislation focusing on impacts of permitted activities on disadvantaged communities.

In 2020–21, Virginia organized a collaborative public–private effort to consider solar facility siting, with a special focus on environmental justice issues.[131] Among the strategies developed in the process were recommendations to:

- map environmental justice communities in collaboration with localities
- incentivize local governments to incorporate environmental justice into zoning and comprehensive plans
- record and consider environmental justice histories of relevant communities during the solar siting process
- coordinate with state government environmental justice bodies
- implement site mitigation practices "informed by" local communities
- identify and provide legal, financial, and development assistance or support for such communities.

Some of these strategies are directed toward the government, while others can be undertaken by project developers.

Research from Berkley Labs concluded that census tracks with below-average median incomes were 1.9 times more likely to have wind or solar farms.[132] Furthermore, American Clean Power reports that "[n]early 80% of U.S. clean power capacity is installed in low-income counties, or counties where the median household income falls below the national median household income."[133] This largely reflects the installation of most utility-scale wind and solar facilities in rural areas where the land area is available.[134] Maryland

Sand Bluff Solar Farm

The Sand Bluff solar farm, and the collaboration between Origis Energy (a solar energy and battery storage developer) and Black residents of Archer, Florida is a great example of a positive outcome resulting from meaningful community engagement that came later than usual in the development process. When Origis proposed a 50MW solar and battery facility in the vicinity of a historic cemetery in Archer, Florida, residents of a Black community with deep historical and cultural roots in the area resisted the development. Resident objections included the proximity of the project to the cemetery, a site of importance and respect for the local community, and a lack of community engagement in the planning process. Ultimately, Origis Energy worked with the residents to develop an agreement that included withdrawing the original project application and working with the community to find an alternative location.[129]

129 "Archer Residents and Origis Energy Reach Agreement for Sand Bluff Project in Alachua County." Origis Energy, Press Release, June 6, 2022, https://origisenergy.com/archer-residents-and-origis-energy-reach-agreement-for-sand-bluff-solar-project/

130 "Solar Siting Analysis 3.0," New Jersey Department of Environmental Protection, 2022. New Jersey Department of Environmental Protection, Solar Siting Analysis available at https://www.nj.gov/dep/ages/solar-siting.html.

131 VNRLI Policy Action Workgroup on Solar Facility Siting, University of Virginia Institute for Engagement and Negotiations.

132 O'Shaughnessy, Wiser, Hoen, Rand, Elmallah. "Drivers and energy justice implications of renewable energy project siting in the United States," p. 15

133 "2021 Annual Market Report," American Clean Power, 2021. https://cleanpower.org/market-report-2021/

134 O'Shaughnessy, Wiser, Hoen, Rand, Elmallah. "Drivers and energy justice

determined that more of its utility-scale solar projects were located in communities not considered as environmental justice communities than in environmental justice communities, although 40% were located in environmental justice communities.[135] These factors present both challenges and opportunities. But among the opportunities is the likelihood that alternative sites in rural areas are more likely to be available, and so conflicts can be ameliorated or avoided.

Siting in environmental justice communities can be a benefit if community needs and concerns are well understood (and coupled with distributional justice benefits, discussed below). While most existing public efforts in the renewables and battery storage space are directed at distributed (e.g., rooftop) and community-scale solar projects, there may be opportunities to collaboratively design larger-scale projects that produce some local economic benefits when sited in disadvantaged communities (if only in terms of taxes and infrastructure). Illinois Solar For All is an initiative designed to identify environmental justice communities and encourage the siting of distributed and small community solar facilities in and near such communities. The Illinois Power Agency implements the program, and Elevate Energy administers the program. While this program is entirely aimed at small-scale solar, review of participating and eligible communities may provide a basis for identifying areas where siting of larger facilities might be consistent with state and community goals.

Siting renewable and energy storage technologies on former fossil fuel facilities or brownfields can also facilitate community acceptance. For example, a recent proposal for a utility-scale solar farm would occupy reclaimed mine lands associated with the closed Dolets Hills coal-fired plant on the Louisiana/Arkansas border, which had occasioned litigation and complaints regarding health impacts to minority communities. Siting facilities on brownfields is not always a guarantee of community support, but it can go a long way toward increasing community acceptance if done in consultation with the community.

As an example, some companies are training staff to incorporate environmental justice analysis as part of siting and risk management processes for proposed projects, incorporating environmental justice considerations into internal evaluation of alternatives even before a proposal has reached a stage where initial commitments have been made. This approach can be coupled with meaningful engagement to ensure that site selection considers factors that matter to the communities. Including environmental justice at this stage also means that funds for environmental justice analysis can be justified in internal budgeting as part of standard risk management.

Design and Operating Approaches

Many renewable power generation developers have substantial experience in determining how to adjust projects to address community, regulatory, or environmental concerns. There are numerous technical resources available.[136] Utility-scale battery storage systems developments are at a slightly earlier stage, as many of the installed and operating projects have been at small to moderate capacity due to demonstration project status, and often located within pre-existing utility-owned facilities or land. The rapidly increasing number, capacity and land footprints of utility-scale storage is quickly highlighting the need for developers to directly engage with community concerns or objections.

Footprint/impact area. Depending on a community's specific concerns, changes to the size or footprint of a proposed project may help resolve conflicts. Actions such as increasing or reorienting buffer areas, utilizing natural landscaping to shield the installation, monitoring the installation in a way that focuses on community concerns to ensure promised mitigation, or decreasing the number or height of structures or other configurations, may be solutions communities may find more acceptable.

Visual and noise impacts. It may be important to determine whether noise or visual impacts create special concerns including health concerns or particular cultural concerns for environmental justice communities and their members. There are numerous resources to assist in evaluating visual impacts of renewable energy projects. These may often be needed where historic or cultural resources are implicated (and may be required by the National Historic Preservation Act).[137] Reorienting elements of solar arrays

implications of renewable energy project siting in the United States," (finding that wind projects were more likely sited in areas with below-average minority populations, while solar projects in areas with somewhat larger minority populations).

135 "Final Report Concerning the Maryland Renewable Portfolio Standards," Maryland Department of Natural Resources, December 2019. https://dnr.maryland.gov/pprp/Documents/FinalRPSReportDecember2019.pdf

136 *Land-Based Wind Energy Siting: A Foundational and Technical Resource*, U.S. Department of Energy, August 2021. https://www.nrel.gov/docs/fy21osti/78591.pdf (operating standards, setbacks, agreements).

137 See research compiled at Bureau of Land Management, Visual Impact Assessment Research and Technical Reports, https://blmwyomingvisual.anl.gov/assess-simulate/research-reports/index.

can assist in avoiding localized impacts of glare and reflectivity for residents and users of land. Noise impacts, often important in the case of wind facilities, can be modeled; and in the case of nearly all facilities can be managed with site configurations, screening, operational provisions, and other measures.

Compatible land uses. In agricultural areas where renewables are being sited, it can be possible to support other productive uses consistent with the facilities. Major concerns for environmental justice communities include farmland loss, associated loss of livelihoods, and loss of historically or culturally-resonant landscapes. Retaining jobs in a community and gaining multiple productive uses from the land may be helpful in addressing community resistance or concern. For example, co-locating crops is frequently consistent with wind facilities, and certain crops may be compatible with solar arrays. Grazing uses might be maintained with wind and some solar configurations. If the site of the proposed project is being leased from a private landowner, co-location of compatible farming or agrovoltaics is one way to diversify revenue sources. Productive co-located activities could include apiaries and pollinator habitats,[138] or with modification to the height and spacing of solar panels, crop production.

Soil loss, flooding, and erosion. Site treatments may also affect environmental justice communities, especially downgradient of a solar site. It has been common practice in the solar industry to remove all vegetation from a site, decreasing fire risk or shading from vegetation, but creating an inhospitable environment for wildlife, and creating issues with runoff and loss of soil and sediments, and requiring lasting reliance on herbicides.[139] There are approaches in which revegetation is not only appropriate, but even preferred in site management. If so, revegetation can be used as an opportunity to address possible concerns with runoff and herbicide pollution. Vegetation can also help mitigate the heat island effects communities may be concerned about in projects designed with asphalt or gravel beneath the panels.[140]

Reporting and complaints. Communities may be particularly interested in establishing reporting and complaint mechanisms to ensure that site problems are promptly identified and addressed by the operator. This has often been the subject of community agreements, required by local zoning approval (where applicable), and/or a condition of a certificate of public convenience and necessity (where applicable). While good land stewardship and being good neighbors is seen as important, absentee management and unresponsive ownership has often been a characteristic of industry in environmental justice communities, and the renewable generation and battery storage industries have an opportunity to overcome this legacy with agreements and prompt follow-through in addressing issues.

Safety and coordination. Communities may want to be certain that emergency response is well coordinated by the company and local officials, and well understood by the affected community. Concerns with runaway thermal events at battery storage facilities, or failures of wind towers or turbines may be front of mind for many communities. The developer can go a long way toward addressing these concerns by being forthright and continuously responsive during the siting and approval process, by proactively addressing and communicating approaches to meet all the relevant building, electrical, and fire codes and standards; considering state-of-the-art safety mitigation technologies and facility designs that may not yet be captured in codes and standards; training and learning from the first responder community; and then following through with regular check-ins during the years of operation.

Construction management commitments. As in any community, construction issues can be addressed with due care for timing, understanding community needs (and uses of roads, periods of quiet, cultural practices), and careful coordination. In addition to making construction commitments, assuring there will be prompt communication of changes or adjustments in an agreed way may be needed to ensure community acceptance.

Ensuring compliance with minimum regulatory standards and going beyond minimum standards when feasible. Meaningful mitigation typically involves going, when feasible, beyond minimum regulatory requirements for public participation – adding value to the community engagement process. Can the community emerge with a "win" related to the time spent in dialogue with the project proponent? Acknowledging the value of community participation is an element of recognition justice that also enhances the credibility of both the project's allies in the community and the company. Sometimes it may not be feasible for a company to go beyond the minimum regulatory standards. Ensuring adequate compliance with minimum regulatory standards for community engagement can make a difference.

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138 "Overview of Pollinator Friendly Solar Energy," EPRI, December 31, 2019. 3002014869

139 Macknick, Jordan; Beatty, Brenda; Hill, Graham. "Overview of Opportunities for Co-location of Solar Energy Technologies and Vegetation." National Renewable Energy Laboratory, December 2013, pp. 2–3. https://www.nrel.gov/docs/fy14osti/60240.pdf

140 Macknick, Beatty, Hill, pp. 5–8, 11–12.

It may not always be feasible that a revision to a project will work for both parties. For example, it may not be financially viable for a developer to scale down a project and still proceed. Alternatively, if a selected site holds specific cultural importance to a community, it is possible that no changes to a project proposal can address the core community concerns of any type of infrastructure on that site. A failure to reach a meeting of the minds does not mean that environmental justice is a wasted effort – rather it reflects that sometimes ultimate goals are not reconcilable at a given location.

Community Benefits

Distribution of benefits as well as burdens is a feature of both distributive and restorative justice. Project developers have opportunities to seek not only mitigation of unavoidable impact of their projects, but also to identify and provide community benefits. What can the community derive from the existence of a utility-scale generating facility or battery storage system that it would not have had otherwise?[141]

Project developers (and particularly regulated utilities) are accustomed to considering community benefits in the context of siting all sorts of electric power infrastructure. But identifying suitable project benefits through an environmental justice lens presents its own set of challenges. While philanthropy, environmental stewardship, and economic develop can be impactful, this is not a model of buying off community leaders with facilities or contributions to civic life, but instead develops actual opportunities rooted in understanding community needs. There is no one-size-fits-all solution. The environmental justice dimensions mentioned above: restorative justice, distributive justice, recognition justice, and procedural justice can serve as guidance points to aid in identifying the best solutions.

The NAACP has articulated goals for solar siting, reflecting the fact that "for too long, policies surrounding solar energy have not adequately offered communities an opportunity to lessen their energy burden, improve health outcomes, or increase access to employment and business opportunities. Additionally, for frontline and BIPOC communities, proximity and ownership of land continues to be a challenge."[142]

Here are a few examples of approaches to benefits in the context of renewable generation and battery storage:[143]

Jobs and Job Security – Environmental justice advocates have identified a goal that jobs associated with renewable energy should be accessible to communities of color and low-income communities.[144] Many of these jobs, particularly for utility-scale facilities, are not that accessible to community members because they require specialized training. Making green jobs accessible to low-income and minority communities not only positively impacts the sustainable development of the area, but it also can increase the diversity in the field.[145] It may be possible for a company to support workforce training and development that is relevant to the community, even if not applicable to the specific facility being sited and constructed. There is particular need for attention to tribal nations, including areas where ongoing maintenance and service may be best performed by local residents of Indian lands.[146] Job training/outreach programs can be supported by companies while the government provides additional support through policymaking.[147] While creating accessible jobs is important, equally important is ensuring equal pay and benefits such as health insurance and retirement that are associated with these jobs.[148] Health care affordability and accessibility would be an added co-benefit to local community members. Environmental justice communities need not be left behind in a modernizing economy, but attention to this set of benefits may best occur on a corporate policy level that can support facility siting, rather than as a series of one-off agreements or accommodations.

At the same time, it is desirable to examine the types of jobs, particularly for ongoing positions, that can be sourced from the local community. Local hiring for site grading, fencing, maintenance, site security, and other tasks may present opportunities to provide values such as incentivizing the growth of the local economy. Concerned communities often raise questions around jobs in the development of utility-scale renewables. Some objections come as these facilities

141 O'Neil, Rebecca; Twitchell, Jeremy; Preziuso, Danielle. "Energy Equity and Environmental Justice Workshop Report," Pacific Northwest National Laboratory, January 2021. https://www.pnnl.gov/main/publications/external/technical_reports/PNNL-30949.pdf

142 "Equitable Solar Policy Principles," NAACP

143 *Solar Futures Study*, Chapter 4 "Understanding the Role of Solar Through the Lens of Equity," U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, September 2021, pp. 76–99. https://www.energy.gov/sites/default/files/2021-09/Solar%20Futures%20Study.pdf
Chapter 4 addresses the role of solar through the lens of equity

144 Outka, "Environmental Justice Issues in Sustainable Development: Environmental Justice in the Renewable Energy Transition," pp. 93–98.

145 Outka, "Environmental Justice Issues in Sustainable Development: Environmental Justice in the Renewable Energy Transition," pp. 93–98.

146 Outka, "Environmental Justice Issues in Sustainable Development: Environmental Justice in the Renewable Energy Transition," pp. 110–111.

147 "Green Jobs Report: Creating A Green Workforce: Community-Based Solutions for a Diverse Green Jobs Sector," Environmental Justice Leadership Forum, 2020. https://www.weact.org/wp-content/uploads/2020/12/FINAL-2_Green-Jobs-Report_Full-Report-Full-View.pdf

148 Jones, Betony; Zabin, Carol. "Are Solar Energy Jobs Good Jobs?," U.C. Berkley Labor Center, July 2, 2015. https://laborcenter.berkeley.edu/are-solar-energy-jobs-good-jobs/

often require little day-to-day operational activity, and communities are concerned about a lack of permanent jobs. Thus, local hiring could target all stages of the project, from initial siting and construction to maintenance and monitoring.

Significant local opposition has occurred particularly around facilities that are using non-local, non-unionized workforces in the construction process.[149] Partnerships with local, unionized workforces can help support a community and win local support for a project. Similarly, partnerships with apprenticeship programs can also become an avenue for communities to learn valuable skills and help build local capacity.[150] This would constitute another way to provide continued support and direct engagement.

It is noteworthy that renewable development has been opposed in some communities because of its implications for loss of jobs in other industries, most notably coal. Especially in these areas, there are benefits to paying attention to employment issues. Improving the accessibility of green jobs ensures in part that low-income and minority communities are not disproportionately affected by the loss of jobs in the energy transition.[151]

Access to renewable energy – Many projects present the situation where the electricity being generated or provided through battery storage is of no direct benefit to the host community. Whether being sold under a power purchase agreement, offered only to customers who pay a premium for renewable energy, or simply a part of the general support of the grid, these energy facilities may be seen as providing no minimal local benefit. Understanding the distributive and restorative justice perspective suggests that it may be important to define how a particular facility can offer any energy value locally. And if it does not, it may be important for companies to work closely with local communities to improve other aspects of their electric power experience – whether through connecting them with supported opportunities for consumer purchase of energy through existing programs, providing orientation and support for individual and small-scale community solar or energy storage access, or adding a communications component crediting the community for its contribution to the modernization of the grid and to decarbonization.[152]

Energy Efficiency – Many environmental justice communities suffer from poor housing stock, poor maintenance, and substantial energy losses through inefficiency that lead to high costs and poor value. One approach to community benefits would link the construction and development of utility-scale renewable and storage resources in a community to a program supporting energy efficiency upgrades or equipment retrofits benefiting local residents.[153] From a community perspective, this benefit may just be credited to "the electric power company," even though consumer efficiency investments that could benefit the community's residents are often completely unconnected to siting and construction of new generation or storage. In designing community benefits, developers could take advantage of the subject matter overlap to ensure that a new utility-scale power project is associated with a local efficiency project. Virginia's solar power siting working group identified this along with other potential benefits that could be offered (e.g., access to affordable broadband, assistance with schools).[154]

Brownfields redevelopment – One of the key opportunities for community benefit is brownfield development for renewable energy or energy storage.[155] Brownfield sites are often contaminated, underperforming, a financial drag on local tax bases, and a community "disamenity." While brownfields siting is often seen an automatic positive by developers, utilities, public policy makers, and elected officials, it could be made even more attractive to environmental justice communities if connected in a meaningful way to selecting sites and conducting site cleanup and management activities that remediate previous and ongoing harms.[156] Tools that can help this endeavor include the Environmental Law Institute's Blight Revitalization Initiative for Green, Healthy Towns (BRIGHT), which is a guide to assist environmental justice communities dealing with

149 "Practices for Just, Equitable, and Sustainable Development of Clean Energy," Ceres, December 2020, pp. 7, 10. https://www.ceres.org/sites/default/files/reports/2021-02/Ceres%20Clean%20Energy%20Design%202020%20FINAL%20update%20Feb21.pdf

150 Jones, Betony; Zabin, Carol. "Are Solar Energy Jobs Good Jobs?"

151 "Practices for Just, Equitable, and Sustainable Development of Clean Energy," p. 12; Aidun et al. "Opposition to Renewable Energy Facilities in the Unites States" (March 2022 edition), Sabin Center for Climate Change Law, pp. 61–62; See also, Finley-Brook, Holloman, "Empowering Energy Justice," p. 926.

152 *Equity and Environmental Justice Considerations for a Clean Energy Transition*

153 Outka, "Environmental Justice Issues in Sustainable Development: Environmental Justice in the Renewable Energy Transition," pp. 120–121.

154 VNRLI Policy Action Workgroup on Solar Facility Siting, University of Virginia Institute for Engagement and Negotiations.

155 Outka, "Environmental Justice Issues in Sustainable Development: Environmental Justice in the Renewable Energy Transition," pp. 111–112.

156 "Solar Industry Policy Principles on Environmental Justice and Equity," Solar Energy Industries Association, p. 5.; Outka, "Environmental Justice Issues in Sustainable Development: Environmental Justice in the Renewable Energy Transition," pp. 111–112.; *Equity and Environmental Justice Considerations for a Clean Energy Transition*

legacy pollution and other issues to empower community-led sustainable development.[157]

Resilience benefits – Climate change impacts are increasing in frequency and intensity. Low income and minority populations are disproportionately affected by natural disasters.[158] Certainly grid modernization, backup generation and battery energy storage for facilities that "could provide critical services to low- and moderate-income neighborhoods during a grid outage," could help provide community support.[159] Maintaining reliable operations can reflect a restorative justice approach for communities that have suffered unreliable service and disinvestment.[160] Helping communities become more resilient to meet the challenges of climate change, economic impacts, and public health crises can improve conditions and generate support for utility-scale projects. It may also be important to include or provide for specific small-scale support for specific facilities alongside the major project, such as facility-specific backup battery power to medical facilities such as rural hospitals that serve environmental justice communities and to community centers that serve disadvantaged urban communities.[161] Resources such as the University of South Carolina Hazard and Vulnerability Research Institute's Baseline Resilience Indicators for Communities (BRIC) tool are useful in identifying how resilient communities are in the event of a natural disaster.[162]

Investments in other community initiatives – Another strategy that utilities or companies may employ is investing in improvements in community services. Communities may lack updated and efficient energy infrastructure or need other infrastructure upgrades. This may be a way to mitigate some of the project's impacts on the community. Benefits may come in the form of donations to community funds or support for civic facility improvements. If employing this strategy, it is important to focus on the dimensions of environmental justice. First, the beneficiaries should be linked meaningfully to those portions of the community who are most affected by the project. Having the money directed to a local board of supervisors may not achieve this end. Furthermore, those most affected may have different opinions on how donations should be spent. These may reflect complicated community dynamics and are important to parse out. Making connections with local leaders in the environmental justice community may be helpful in finding consensus on where to direct such funds.

Some communities also express a desire for ownership interest in projects sited in their community. Such strategies have been successful in some large community solar installations in the U.S., and in wind installations abroad, but haven't typically occurred in utility-scale operations. This may be a solution to a perceived lack of decision-making power, real engagement, and direct benefits from the project for environmental justice communities. In the Canadian context, for example, scholars have shown that providing the opportunity for significant meaningful ownership of energy infrastructure projects to indigenous communities could minimize inherent regulatory uncertainty risks (e.g., litigation, denied permits) in energy infrastructure projects while integrating local knowledge and values into the project proponent's ESG strategies.[163] In their view, significant meaningful ownership has two main components: a considerable total percentage ownership interest that affords the community-owner the right to participate in the governance and affairs of the project, and a meaningful long-term revenue source. Furthermore, they point out that considering the appropriate vehicle for co-ownership (e.g., equity investments financed through special loan or grant programs), ownership terms, acquisition price, dividends, participation in governance and management decisions, and exit rights are all central when negotiating significant meaningful ownership agreements.

Community Benefits Agreements – One formal means of providing for community benefits that has been used in the environmental justice context is a community benefits agreement (CBA). These provide transparency and a vehicle for mutual accountability.[164] The

157 "Blight Revitalization Initiative for Green, Healthy Towns (BRIGHT)," Environmental Law Institute. https://www.thebrightguide.com/

158 *Climate Change and Social Vulnerability in the United States: A Focus on Six Impacts*, U.S. Environmental Protection Agency, September 2021. https://www.epa.gov/system/files/documents/2021-09/climate-vulnerability_september-2021_508.pdf. This report discusses the degree to which socially vulnerable populations may be more exposed to the highest impacts of climate change in six categories: Air Quality and Health, Extreme Temperature and Health, Extreme Temperature and Labor, Coastal Flooding and Traffic, Coastal Flooding and Property, and Inland Flooding and Property.

159 "Governor's Task Force on Renewable Energy Development and Siting, Final Report," Maryland, August 14, 2020, p. 46. https://governor.maryland.gov/wp-content/uploads/2020/09/REDS-Final-Report.pdf

160 Tarekegne, O'Neil, Twitchell, "Energy Storage as an Equity Asset," p. 153.

161 "Equity and Resilience: Implications at the Intersection of Climate Change and Community," EPRI, September 2, 2022. 3002025062

162 "Baseline Resilience Indicators for Communities," University of South Carolina-Hazards and Vulnerability Research Institute, 2015. https://experience.arcgis.com/experience/376770c1113943b6b5f6b58ff1c2fb5c/page/BRIC/. The BRIC tool evaluates 6 metrics: social, economic, community capital, institutional, infrastructure, and environmental to identify a community's disaster resilience.

163 Warrier, Vivek; Morison, Luke; White, Ashley; Buffalo, Stephen. "Indigenous Ownership of Natural Resource Projects: A Framework for Partnership and Economic Development," *Alberta Law Review*, Vol. 59, No. 2, 2021. https://albertalawreview.com/index.php/ALR/article/view/2678/2629.

164 See *Guide to Advancing Opportunities for Community Benefits through*

U.S. Department of Energy (DOE) recommends:

> The CBA process should begin while energy development is still being formulated by the project proponent. It is important to consider participation in proposed projects that have the potential to offer benefits and those that impact immediate and surrounding neighborhoods. Once a coalition is formed, the community should announce its formation, thereby making it easier for developers to communicate and foster cooperation. Developers should actively seek partnership with neighborhoods, as their support would raise the probability of state or local government approvals for zoning variances, state permits, and other regulatory approvals.

The DOE identifies several typical commitments and benefits of such agreements:

A. Potential Developer Benefits – The Community Coalition agrees to support the project, with public testimony and written statements; community support reduces risk for developers, by uniting community groups behind a project; and developers more reliably get needed state or local subsidies or approvals.

B. Potential Community Benefits – Local and targeted hiring commitments; living wage and benefits; educational partnerships between developers and community schools; and support for local, small business.[165]

Community Benefits Agreements are a type of Good Neighbor Agreement, a category of agreement historically used by mining companies and industrial facilities. These agreements formalize a company's duties to affected communities.[166] These agreements can include environmental protections such as pollution monitoring and control, community access to information about the facility, accident preparedness, and opportunities for facility tours/inspections. In some cases, Good Neighbor Agreements can also include benefits such as hiring practices, donations to community benefit funds, infrastructure improvements, or processes for dispute resolution.[167] Paying attention to generating *locally relevant benefits* is the key to a successful environmental justice approach that goes beyond procedural justice and distributional justice. Historically, most environmental justice communities have experienced few meaningful benefits from facilities or, worse, have suffered the imposition of losses and risks with little benefit. Even where a specific solar or wind farm or battery storage facility will not directly support a given community, there are frequently ways in which value can be generated.

O'Shea Solar Park

The O'Shea Solar Park in Detroit, Michigan offers an example of successful community engagement over siting and community benefits. While not technically an example of utility-scale solar as defined in this paper, at only 2.44 MW, the park still offers key insights for a successful project in environmental justice communities. DTE Energy, in partnership with the city of Detroit, proposed a solar installation in O'Shea Park, a blighted area of Detroit. Originally, the proposal was solely intended to develop solar energy on the site. However, surrounding residents objected to the proposed replacement of a decommissioned community center. The community center "represented one of the last institutional establishments in the area and had been [the community's] hub for generations, and many hoped that it could be restored for future generations." In order to find consensus, DTE first identified a leader from the local community, rather than an outside planner, to organize meetings. The developers took other actions to benefit the community. These included providing energy efficiency audits and upgrades for surrounding homes; utilizing local labor by hiring electrical apprentices from the surrounding community; honoring the community center and its impact by painting the former site; building walking paths, basketball courts, playing fields, and a stage; and installing native plants to manage runoff and attract pollinators.[168]

Energy Project Development, U.S. Dept. of Energy Office of Minority Business and Economic Development, August 1, 2017. https://www.energy.gov/sites/default/files/2017/09/f36/CBA Resource Guide.pdf

165 *Guide to Advancing Opportunities for Community Benefits through Energy Project Development.*

166 Kenney, Douglas, Stohs, Miriam; Chavez, Jessica; Fitzgerald, Anne; Erikson, Teresa. "Evaluating the Use of Good Neighbor Agreements for Environmental and Community Protection: Final Report," University of Colorado Law School, 2004. https://scholar.law.colorado.edu/cgi/viewcontent.cgi?referer=&httpsredir=1&article=1018&context=books_reports_studies

167 González, Thalia; Saarman, Giovanni. "Regulating Pollutants, Negative Externalities and Good Neighbor Agreements: Who Bears the Burden of Protecting Communities." *Ecology Law Quarterly*, Vol. 41, No. 1, 2014), pp. 37–79. https://www.jstor.org/stable/pdf/24113661.pdf?seq=1

168 Dodinval, Claire. "Brownfield Developments: O'Shea Solar Park – Detroit," April 2020. https://graham.umich.edu/media/pubs/Solar-Brownfield-Development-OShea-Solar-Park%E2%80%93Detroit-46934.pdf

Metrics can be an useful tool for project developers for establishing targets, tracking progress, and ensuring short- and long-term goals for creating and implementing community benefits are met. Establishing measurable outcomes and actions also allows project developers to be held accountable when those outcomes and actions are not being met.[169] However, a metrics-based approach can be challenging to implement and in some cases does not constitute the best method to measure progress, such as with building community trust and respect.

- Measurable outcomes that can be identified vary depending on the actions taken and on the stage of the project. While not an exhaustive list, potential metrics can include: Increase in efforts to meaningfully engage communities such as the number of public meetings held and in which localities, increase in funding for participants in public meetings, and the increase in projects engaged with prior consent and consultation with environmental justice communities.[170]
- Decrease of GHG emissions in metric tons of CO2 and GHG intensity. [171]
- Increase in grid resiliency in critical community infrastructure such as health care centers.
- Decrease in metric tons of criteria pollutants.[172]
- Decrease in share of household income spent on fuel and electricity.[173]
- Decrease in household energy use for each income group and corresponding fuel mix.[174]
- Increase in percent of population living within a reasonable distance from a heat island mitigation feature that provides localized cooling trough tree canopy cover, green roofs, green walls, white roofs or cool roofs and/or light-colored pavement.[175]
- Decrease in income inequality.[176]
- Decrease in percentage of residents living below poverty line. [177]
- Increase in local energy generation in GWh generated per year.[178]
- Increase in percent of energy resources/assets owned or controlled by the local community, women and equity business enterprises.[179]

Leading Practices

Review of environmental justice practices suggests five key options that can enable project developers to advance renewable energy and battery storage system deployments while respecting and advancing environmental justice goals. There is great opportunity for project developers to become industry leaders in advancing environmental justice considerations in the development of renewable energy and battery storage.

1. **During the site selection process, determine whether the vicinity includes one or more environmental justice communities, using a screening tool and other information.** Project teams can "ground-truth" the information using a no-threshold approach initially to ensure that small or dispersed minority communities are not overlooked during the siting process, and so that concerns do not come as a surprise later in the process.

2. **Evaluate project approaches and opportunities for meaningful engagement, mitigation, and benefits with respect to all four of the environmental justice dimensions to determine what impacts may be perceived and how each may be addressed.** Procedural and distributional justice are likely to be the most familiar to employees and company staff, but attention to restorative justice and recognition justice as guide points can aid in identifying the best solutions. An environmental justice policy that incorporates the four dimensions can ensure clarity on key guidelines to follow from planning to execution of a project.

169 Lanckton, DeVar. *Justice in 100 Metrics*. *See also,* EPRI, "Measuring Energy Justice," May 2022. (metrics to measure energy equity).
170 Lanckton, DeVar. *Justice in 100 Metrics*.
171 "Local Development Business Plan," East Bay Community Energy, 2022. https://ebce.org/local-development-business-plan/
172 "Local Development Business Plan," East Bay Community Energy.
173 *Energy Indicators for Sustainable Development: Guidelines and Methodologies.* International Atomic Energy Agency, April 2005. https://www-pub.iaea.org/MTCD/publications/PDF/Pub1222_web.pdf; "How do we measure equity in energy efficiency," Southeast Sustainability Directors Network. http://www.southeastsdn.org/wp-content/uploads/2019/11/How_do_we_measure_equity_in_energy_efficiency_FINAL.pdf
174 *Energy Indicators for Sustainable Development: Guidelines and Methodologies.*
175 "LEED for Cities and Communities," U.S. Green Building Council, 2022. https://www.usgbc.org/leed/rating-systems/leed-for-cities-communities#:~:text=LEED%20for%20Cities%20and%20Communities%20helps%20local%20leaders%20create%20and,are%20planned%2C%20developed%20and%20operated (LEED is a green building rating system developed by the U.S. Green Building Council. LEED for cities and communities scales their green rating system, encompassing social, economic, and environmental indicators, to a city and community level.)
176 "Indicators," National Equity Atlas, 2022. https://nationalequityatlas.org/indicators
177 "Indicators," National Equity Atlas.
178 "LEED for Cities and Communities," U.S. Green Building Council.
179 Lanckton, DeVar. *Justice in 100 Metrics*.

3. **Undertake meaningful engagement using a stepwise approach.** The steps to meaningfully engage local communities heavily depend on the community involved in the process, and what means of engagement they find "meaningful" to their needs. What worked with one community might not be as effective with other communities. After identifying the potentially relevant affected communities:
    - Meet with community-based organizations and key individual local leaders early in the process; gain understanding of the community's history, previous experiences, stresses, and aspirations (cultural understandings, especially when working with indigenous communities).
    - Plan a proactive meaningful engagement strategy based on this understanding.
    - Be prepared for changes, discoveries, and learning.
    - Commit to integrity/transparency/disclosure.
    - Increase community capacity with training, access, local expertise.
    - Show flexibility in implementation.
4. **Design mitigation approaches collaboratively to address community concerns.** Solutions may be more acceptable and durable if community members have a stake in their development. Whether or not agreements are achieved, committing to recognition justice is likely to result in improving trust and building strong relationships.
5. **Identify and implement community benefits.** While the benefits of a solar, wind energy, or battery storage project may be self-evident to project proponents, a community's perception of benefits may be framed by its experiences. Effective delivery of benefits goes beyond simply traditional siting techniques, contributions, and community relations. It includes recognizing past environmental injustices, and finding ways to link new project activities and direct project activities to the creation of community value.

Conclusion

The rapid growth of renewable energy and battery storage is changing how we provide and consume energy for the long term. While the transition away from fossil fuels is regarded as a positive change for climate and other reasons, it may still contribute to creating challenges for environmental justice communities located where projects are developed. As with other energy projects, integrating environmental justice considerations into renewable energy and battery storage projects means proactively ensuring "meaningful engagement" of environmental justice communities in the planning, development, and operation of projects, developing implementable risk-mitigation strategies, and identifying and delivering practical community benefits directly related to the project being proposed and responsive to community needs.

While not an exhaustive compilation of all the ways in which environmental, health, economic, or social burdens might affect communities, this paper suggested approaches that can be implemented to identify relevant communities and engage with actual community concerns. It also described leading practices to advance each of the dimensions of environmental justice when siting, designing, constructing, operating, and decommissioning these facilities.

Lastly, this paper enumerated five main opportunities that could advance the deployments of renewable energy and battery storage systems while furthering environmental justice goals. They include:

1. identifying environmental justice communities in the area during the site selection process
2. evaluating the opportunities for meaningful engagement of these communities
3. identifying risk-mitigation strategies and community benefits
4. utilizing a concerted strategy for meaningful engagement that considers the characteristics and needs of the communities
5. creating risk-mitigation approaches and benefits collaboratively with communities.

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