

Evaluating and Advancing Equity in Energy Transitions

Justice and equity metrics for researchers, communities, and policy makers

Based on S. Kime et al. *Environmental Research Letters* [DOI 10.1088/1748-9326/ad08f8](https://doi.org/10.1088/1748-9326/ad08f8) (2023).

The Policy Problem

Energy transition policies, if not carefully implemented, can create or exacerbate inequities, particularly affecting Black, Indigenous, and People of Color (BIPOC), low-income, and other frontline communities. While there is broad recognition that equity and justice are critical to the transition, a lack of metrics for evaluating outcomes hampers effective policymaking. To address this, we've constructed an analytical framework to evaluate justice and equity impacts of energy transitions.

Key findings and proposed solutions

- Evaluating equity within energy transitions is complex and depends on the the type of transition, population characteristics, and historical injustices within a given region
- In order to support equity and justice evaluation, our framework categorizes metrics into three dimensions—health, access, and livelihood—each with a specific set of indicators and examples of associated metrics
- Metrics can be adapted and combined with relevant socioeconomic and demographic data to evaluate impacts across communities, providing flexibility for tailored use in different contexts
- You can learn more and explore specific indicators and metrics on our [website](#).

What We Found

Metrics to evaluate equity in energy transitions should be nuanced, context-specific, and consider the history of marginalization in a given region. Our framework categorizes metrics into three dimensions: health, access, and livelihood. Each of these dimensions includes a specific set of indicators for equity evaluation, and each indicator contains multiple metrics to quantify, monitor, and evaluate that indicator. To explore this framework further, including detailed indicators, metrics, and examples, visit [The 2035 Initiative website](#) to see this framework applied to four key low-carbon energy transitions: renewable energy deployment, fossil fuel infrastructure phaseout, transportation electrification, and residential building decarbonization. We aim to empower stakeholders — including policymakers, planners, and community leaders — with these metrics to ensure that energy transition programs and policies produce just and equitable outcomes for all.

What We Did

Through a comprehensive literature review of over 400 articles and reports from a wide range of disciplines including public health, economics, sociology, and public policy, we identified metrics used to quantify energy inequities in approximately 132 papers. We focused on literature that included quantitative assessments of energy systems and transitions, and filtered for those that were published between 2000 - 2023. Our review systematically documented the distribution of both positive and negative impacts of energy transition policies, programs, and infrastructure development.

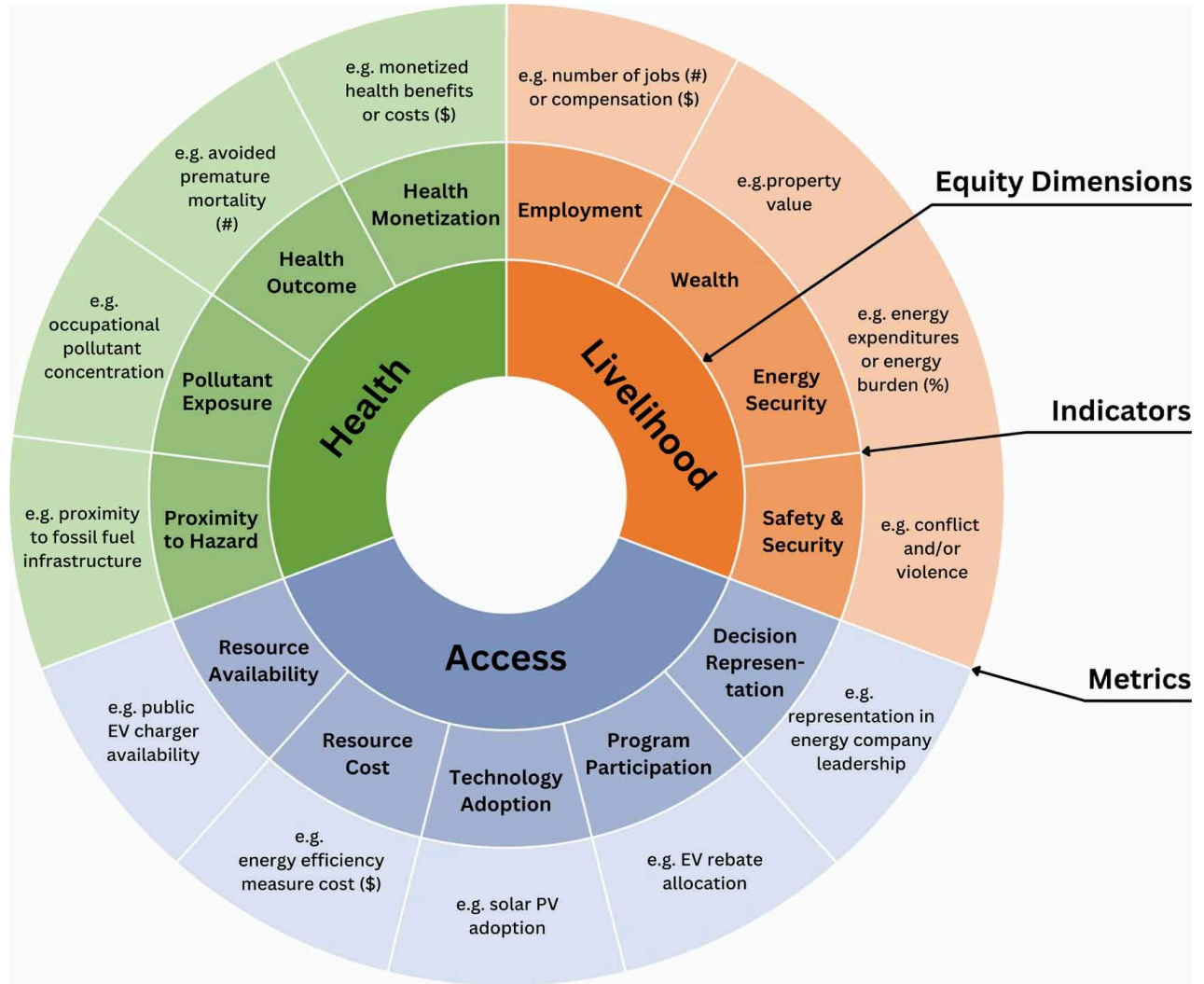


Fig. 1 Our energy equity evaluation framework details the three equity dimensions of *health*, *access*, and *livelihood*, along with the associated indicators and metrics. See our [website](#) for more details.