

The University of Chicago

Solar Strategies:
Stakeholder perspectives on a Chicago solar training program's
intersectional energy justice work

By Theo Lesser



A thesis submitted for partial fulfillment of the requirements for a Bachelor of Arts degree in
Environmental and Urban Studies

Preceptor: Xixi Jiang
Faculty Advisor: Chad Broughton

5/5/2023

Abstract:

This paper explores energy justice and the “just transition” in the context of environmental policy, utilizing stakeholder perspectives to examine how solar training programs serve as a nexus for intersectional energy justice work in Chicago. Although researchers have explored the use of solar training programs in coal communities and other fossil fuel communities, the literature lacks sufficient understanding of how these programs play important roles in other settings. Administrators and participants of a nonprofit solar training program in Chicago were interviewed to understand their perspective on the role of these programs in their communities. These interviews reveal the way that solar training programs can improve green job access in non-rural communities and emphasize how the sudden growth of the renewables sector has created an opportunity to reimagine the energy industry.

Introduction:

The passage of federal and state level climate policy in the United States has shifted the debate from whether climate action should be taken to how this action should be taken.

Looking specifically at the grid, there are many factors to consider surrounding climate change and the energy system, all of which intersect with already prevalent inequalities and inequities.¹ The price of electricity will likely rise, as the need to heat and cool raises demand and increased ambient air temperature reduces grid efficiency.² Necessary climate policy may also raise energy prices as utilities must invest in newer and greener infrastructure.³

Simultaneously outages may rise along with increases in grid load and extreme weather.⁴ Tax rebates will be increasingly distributed to individuals and organizations for climate friendly

¹ Walker and Day, “Fuel Poverty as Injustice”; Hernandez, Aratani, and Jiang, “Energy Insecurity among Families with Children.”

² USGCRP, “Fourth National Climate Assessment.”

³ Kaswan, “Greening the Grid and Climate Justice.”

⁴ Auffhammer, Baylis, and Hausman, “Climate Change Is Projected to Have Severe Impacts on the Frequency and Intensity of Peak Electricity Demand across the United States.”

behavior.⁵ Finally, there will be massive job growth in green sectors, in particular in the renewable energy industry.⁶

It is necessary to consider who will bear these costs and take advantage of these benefits, and who will have the opportunity to weigh in on key decisions. To help answer these questions, the fields of energy justice and the just transition have emerged to examine these considerations and propose a forward-looking agenda.⁷

This paper uses the lens of these two movements to explore green jobs - one benefit of the transition away from fossil fuels - and understand what role solar training programs will serve moving forward. With this approach, I examine a solar training program in Chicago to provide a case study for the implementation of a successful energy justice and just transition focused program. In particular, I explore a range of research questions including:

- What is the importance of non-rural solar training programs?
- What role does this training program play in the lives of participants and their communities?
- How does the program interact with other nonprofit support services and policy areas?
- How do the program administrators understand justice in the context of their program?

⁵ Borenstein and Davis, "The Distributional Effects of US Clean Energy Tax Credits." 217

⁶ Welton and Eisen, "CLEAN ENERGY JUSTICE: CHARTING AN EMERGING AGENDA." 332

⁷ Jenkins et al., "Energy Justice."

Answering these questions serves to demonstrate how non-rural solar training programs will play an important role in achieving energy justice goals. It also provides an example of some of the challenges and opportunities for such an energy justice program, allowing policymakers to refine such programs moving forward.

The paper begins by providing background on the solar sector and the state policy landscape. I then proceed to review the literature surrounding energy justice and the just transition, observing how solar training programs have previously been studied. Next, the paper includes a discussion of my methodological approach to the topic before analyzing my qualitative data to understand the implementation of these programs. Ultimately, I conclude that non-rural solar training programs can serve as a key nexus for intersectional energy justice work, and I explore some of the barriers that have obstructed the program to date to understand how its design can be streamlined. Finally, I emphasize the opportunity for imagination, and the unique prospect in the renewables industry to create an inclusive and just workforce.

Background:

The Renewable Energy Industry:

As the cost of constructing renewable energy infrastructure has fallen, and incentives for these projects have increased, the renewable energy industry has exploded. The growth in renewables is expected to account for 95% of the expansion in global energy capacity between

2021 and 2026.⁸ In the United States, renewables have been the fastest growing energy source with 42% growth between 2010 and 2020.⁹ In 2020, renewables made up nearly 20% of utility scale generation in the United States.¹⁰ This expansion has created a corresponding trend in the job market. Globally, 700,000 jobs were created in the renewable sector in 2021, with the most growth being seen in the solar industry.¹¹ This trend appears in the United States as well, where there has been a rapid rise in renewable energy jobs.¹² In 2021, about 3 million Americans worked in the renewable energy industry, which is more than three times as many as those who worked in the fossil fuel industry.¹³ The US Bureau of Labor Statistics predicts that solar installation technician and wind farm technician will be the two fastest growing occupations in the coming decades, far outpacing any other competitors.¹⁴ Both in the United States and globally, the expansion of the renewable energy industry has created significant quantities of new jobs in a young sector. This expansion of jobs represents a massive allocation of wealth that will be flowing towards those who are able to access the jobs, making it critical to understand who can participate in this labor sector.

⁸ IEA, “Renewables 2021 - Analysis and Forecast to 2026.” 14

⁹ “Renewable Energy.”

¹⁰ “Renewable Energy.”

¹¹ IRENA and ILO, “Renewable Energy and Jobs: Annual Review 2022,.” 3

¹² Welton and Eisen, “CLEAN ENERGY JUSTICE: CHARTING AN EMERGING AGENDA.” 332

¹³ Schroeder, “Clean Jobs America 2021: AFTER HARD YEAR, PROMISE OF UNPARALLELED JOBS GROWTH.” 4

¹⁴ Carley and Konisky, “The Justice and Equity Implications of the Clean Energy Transition.” 572

This booming industry faces undeniable challenges, however. As is the case in the fossil fuel industry, the renewable energy industry lacks demographical diversity on multiple fronts.¹⁵ In 2018, for example, the solar energy workforce in the United States was 26.3% women and 7.6% Black, which is lower than the average for all occupations across the United States.¹⁶ Unsurprisingly, these numbers are similarly low for the energy efficiency industry, which is 24% women and 8% Black.¹⁷ Looking specifically at the executive level, solar executives are 88% white and 80% male, making this management level incredibly homogenous.¹⁸ The industry seems to face a serious problem when it comes to diversity. Because these jobs represent enormous allocation of wealth, this lack of inclusion could serve to reinforce patterns of inequality. The lack of diversity could additionally mean that there is less representation of all groups in decision-making for a for the industry, which would ultimately serve to reinforce structural patterns of injustice.

Interestingly, there also seems to be a divide in how different groups enter the renewables industry. For example, while white employees typically find their positions in the solar industry through personal connections and word of mouth, it appears that people of color in the industry do not have the same access to these networks.¹⁹ People of color primarily find their jobs in the solar industry through job fairs and training programs, rather than through

¹⁵ Carley and Konisky. 572

¹⁶ Carley and Konisky. 572

¹⁷ Carley and Konisky. 572

¹⁸ The Solar Foundation, "US Solar Industry Diversity Study 2019." 8

¹⁹ The Solar Foundation. 10

their social and professional networks.²⁰ These two different routes of entry into the industry suggest that to improve the diversity of the industry, one route of intervention could be through solar training programs.

Solar Training Programs:

Solar training programs are appearing across the country to retrain employees for employment in the solar sector. These programs are often government funded and provide an easy route for people to enter this rapidly growing sector.²¹ This support can be directly from the Department of Energy, or through various multilayered grant processes. Although there is no clear count of these programs, the DOE has directly assisted over 1,000 community colleges in setting up such a program, and likely thousands more exist through other routes of funding.²² As discussed above, these programs often serve people of color, who are less likely to receive jobs in the solar industry through their social and professional networks.²³ In this context, solar training programs play an important role in creating diversity in the industry.

Solar training programs often involve classroom time and hands on learning over the course of multiple months.²⁴ There are also often career fairs, employer connections, mentorship, and/or other forms of job placement integrated into these programs.²⁵ This allows

²⁰ The Solar Foundation. 10

²¹ "Job Training."

²² "Solar Training Network."

²³ The Solar Foundation, "US Solar Industry Diversity Study 2019." 10

²⁴ "Solar Program | LVEJO."

²⁵ "Solar Program | LVEJO."

participants to not only receive the appropriate skills and certification to become a solar installer, but additionally to be set up for success in the workplace.

State Policy:

In 2016, the Illinois state legislature signed the Future Energy Jobs Act (FEJA) into law.²⁶ The passage of this bill followed on the heels of years of organizing by community groups.²⁷ It ultimately served as a compromise between a coalition of community organizations, called the Illinois Clean Jobs Coalition (ICJC), and more conservative interests including the state's largest utility, ComEd.²⁸ The bill invested massively in programs for low income and underserved communities.²⁹ In its final form, the legislation included a range of provisions such as requirements for significant electricity demand reduction through energy efficiency upgrades, incentives to utility providers for energy savings, energy efficiency programs for low income households, a \$750 million investment in the Solar for All community solar program, rate caps, and among other provisions, workforce development programs aimed at underserved communities.³⁰ It was this bill that allowed for the formation of the solar training program that is being examined in this paper. It was formed as part of the bill's goal to place 2,000 individuals from underserved communities, including economically disadvantaged and environmental

²⁶ Shepherd, "Future Energy Jobs Act."

²⁷ Shepherd.

²⁸ Paddock, "Energy Efficiency and Distributed Solar Energy Targeted to Underserved Communities: Perspectives on the Illinois Future Energy Jobs Act." 90

²⁹ Shepherd, "Future Energy Jobs Act."

³⁰ Paddock, "Energy Efficiency and Distributed Solar Energy Targeted to Underserved Communities: Perspectives on the Illinois Future Energy Jobs Act." 88-89

justice communities, foster care alumni, and formerly incarcerated individuals, in jobs by 2029.³¹ The program studied in this paper was the only solar training program funded in the Chicagoland area by FEJA.³²

After the passage of FEJA, ICJC continued to push for investment in legislation around energy justice. The organization began organizing in 2018 and hoped to use what they had learned from the implementation of FEJA to update the bill.³³ The bill, titled the Climate and Equitable Jobs Act (CEJA), was eventually passed in late 2021 and represented a significant investment in a range of measures around climate change.³⁴ The bill creates a pathway for a carbon-free energy sector in Illinois by 2045, a significant investment in renewable energy rollout, and an increase of funding to workforce development programs for underserved communities.³⁵ This bill is designed to target ‘Environmental Justice Communities’ which are identified using the EPA EJ Screen tool as having higher vulnerability to environmental hazards, and ‘Restore. Reinvest. Renew. Areas’ (R3) which were defined under Illinois’ cannabis legislation and include communities disproportionately impacted by incarceration, violence, and economic disinvestment.³⁶ CEJA has continued the investment in solar training programs, but the programs that it funded have not been rolled out yet, meaning that at this point, the state of Illinois is still operating under the FEJA framework.

³¹ “Future Energy Jobs Act Workforce Development Programs.”

³² “Future Energy Jobs Act Workforce Development Programs.”

³³ Illinois Clean Jobs Coalition, “Climate and Equitable Jobs Act Overview.”

³⁴ “CEJA FAQ.”

³⁵ Illinois Clean Jobs Coalition, “Climate and Equitable Jobs Act Overview.”

³⁶ Illinois Clean Jobs Coalition.

With the transition away from fossil fuels, there will be a massive allocation of jobs and resources, as a new labor sector appears as if from nowhere. Although there are obstacles to diversity in the renewables industry, mechanisms like solar training programs can ensure inclusiveness. In Illinois, bills have been passed to create these programs, and expand workforce development opportunities in the state. In this context, it is important to understand how solar training programs are shaping the allocation of jobs, and therefore the opportunity to reshape one's material conditions, across the country.

Literature Review:

To contextualize solar training programs in the literature, I turn to scholarship focused on environmental justice and the just transition. These two movements are often highlighted when attempting to apply justice principles to the energy system. This similar focus leads to some area of overlap between the two movements. There are, however, key differences between these fields. By exploring the origins of these two fields and defining their conceptual focus, I hope to reveal that this relationship obscures a tension or gap between these two literatures that has not been properly confronted, whereby the differing scope with which they examine equity issues leads them to emphasize different routes of achieving justice. This mismatch has caused some policy programs, such as solar training programs, to remain inadequately studied. To this end, I examine how solar training programs are situated in these two connected fields, and in doing so I discuss the ways that past studies have failed to adequately examine the possibilities for solar training programs outside of limited applications in rural contexts.

Energy Justice:

The energy justice movement does not have a distinct origin but grew out of the existing environmental justice movement.³⁷ For this reason, although it does not have a unified conceptualization in the literature, its focus is familiar to the environmental justice movement. Energy justice broadly focuses on applying justice principles to the energy system across its entire lifecycle, from generation to delivery.³⁸ Multiple frameworks, however, have vied for centrality, leaving the field fractured.

One of these conceptualizations is the “triumvirate of tenants”. This system was introduced by the authors McCauley, Heffron, Stephan, and Jenkins, in 2013, which is when energy justice was first being discussed in the literature.³⁹ In this paper the authors claimed that energy justice should focus on three principles. These principles include: distributive justice, which looks at who is receiving the burdens and benefits of the energy system; procedural justice, which examines who is included in decision-making processes; and recognition justice, which ensures that all groups are being respected and fully represented.⁴⁰ This conceptualization has been used by many authors and has formed the basis of much of the succeeding literature.⁴¹

³⁷ McCauley et al., “Advancing Energy Justice.”

³⁸ Healy, Stephens, and Malin, “Embodied Energy Injustices.”

³⁹ McCauley et al., “Advancing Energy Justice.”

⁴⁰ McCauley et al.

⁴¹ Carley and Konisky, “The Justice and Equity Implications of the Clean Energy Transition”; Pellegrini-Masini, Pirni, and Maran, “Energy Justice Revisited”; Jenkins et al., “Energy Justice.”

Sovacool et al. critiqued this triumvirate and sought to build a new conceptualization of energy justice.⁴² Their paper argued that the triumvirate had failed to properly account for non-western and non-anthropocentric conceptualizations of energy justice and sought to expand the concept of energy justice to include these factors more completely.⁴³ It did so by proposing 10 principles of energy justice, including availability, affordability, due process, transparency/accountability, sustainability, intragenerational equity, intergenerational equity, responsibility, resistance, and intersectionality.⁴⁴ Although an in-depth analysis of each of these terms would not be feasible, this conceptualization has clear departures from the triumvirate, including many specific considerations that the triumvirate does not address, such as intergenerational equity.⁴⁵

Both of these dominant theorizations in the field have been subject to critique. Bouzarovski and Simcock noted that few scholars have turned their attention to the application of energy justice concepts to the real world, focusing instead merely on theorization.⁴⁶ These authors called for the integration of restorative justice principles to energy justice, as a way to more carefully examine the implementation of energy justice.⁴⁷ In particular, they stated that “[r]estorative justice aims to repair the harm done to people (and/or society/nature), rather

⁴² Sovacool et al., “New Frontiers and Conceptual Frameworks for Energy Justice.”

⁴³ Sovacool et al.

⁴⁴ Sovacool et al.

⁴⁵ Sovacool et al. 687

⁴⁶ Heffron and McCauley, “The Concept of Energy Justice across the Disciplines.” 660

⁴⁷ Heffron and McCauley. 660

than solely focus on punishing the offender.”⁴⁸ This framework forces scholars to look more carefully at present and future policy and practices by focusing on remediating harm.

The paper *Spatializing Energy Justice* leveraged another critique.⁴⁹ Here, the authors focused on the failure of previous theorizations to properly account for spatial inequality and inequity as opposed to merely inequality between groups.⁵⁰ They argue that this spatially focused lens could better help address injustice.

Although these are just some of the many conceptualizations of energy justice that have been proposed, they serve as strong examples of the diversity and variation within the field.⁵¹ In *Energy Justice Revisited*, the authors argued that varied conceptions of energy justice did have unifying principles rooted in two broader principals of equality, including formal and substantive equality.⁵² Although these simplified principles leave out some of the nuances of the more complex theorizations, they demonstrate that despite different framings, there remains commonalities and shared principles across the entire field of energy justice.

Looking at these many understandings of energy justice, it is clear that the energy justice movement is attentive to the many facets of injustice in the incumbent energy system and hopes to examine them in whatever front they may appear. The movement seeks to

⁴⁸ Heffron and McCauley. 660

⁴⁹ Bouzarovski and Simcock, “Spatializing Energy Justice.”

⁵⁰ Bouzarovski and Simcock. 641

⁵¹ Jenkins et al., “The Methodologies, Geographies, and Technologies of Energy Justice”; Jenkins et al., “Towards Impactful Energy Justice Research: Transforming the Power of Academic Engagement.”

⁵² Pellegrini-Masini, Pirni, and Maran, “Energy Justice Revisited.”

identify and address inequities on many fronts and aims to work towards a more equitable and inclusive energy system.

The Just Transition:

The just transitions literature, on the other hand, has a very different origin, which has ultimately resulted in a distinct conceptual framework. The phrase, “just transition,” was originally employed when unions in environmentally-harmful industries saw a threat to their workers as these industries were phased out.⁵³ The movement focused on industries that were at risk from policy changes and attempted to minimize the harm that would befall the labor force.⁵⁴ Because the fossil fuel industry is likely to be harmed by climate policy, understanding how to cushion the harm to this industry has been the recent focus of this field.⁵⁵ Although the goals of this field are evidently important, this origin has produced a continued to color the focus of the field.

The just transition literature is centered on examining the harms and benefits that are produced by transitions between fuel types, primarily between fossil fuels and renewables.⁵⁶ The movement seeks to mitigate these harms, utilizing the ample benefits produced by the transition in order to mitigate and minimize the harms of the transition.⁵⁷ These benefits include “cleaner sources of energy, reduced emissions from the removal of fossil fuels, and the

⁵³ Gambhir, Green, and Pearson, “Towards a Just and Equitable Low-Carbon Energy Transition.”

2

⁵⁴ Gambhir, Green, and Pearson. 3

⁵⁵ Gambhir, Green, and Pearson. 6

⁵⁶ Carley and Konisky, “The Justice and Equity Implications of the Clean Energy Transition.”

⁵⁷ Carley and Konisky.

employment and innovation opportunities that accompany this transition.”⁵⁸ This literature has typically framed ‘justice’ through the lens of the triumvirate of tenants that was discussed earlier, but once again limits the application of these tenants to the changes produced by the transition away from fossil fuels.⁵⁹ This focus connects to the movements origins in protecting workers from disruptions to polluting industries.

Although these two movements are closely linked, there is a difference in the scope of their focus that is significant. As discussed above, the just transition literature is laser-focused on the harms and benefits produced by the transition away from fossil fuels and using the benefits of the transition to mitigate the harms. This means that the field deemphasizes an exploration of the incumbent injustices in the energy system. Conversely, these incumbent injustices are the precise focus of the energy justice movement, which looks at the current state of the energy system and attempts to confront the injustices that are present. In other words, the just transition literature examines injustices that will be produced, while the energy justice literature examines injustices as they exist. Each of these fields offers a useful perspective, but also elides a different understanding of justice. When programs are only considered in the context of one of these fields, important opportunities can be overlooked. This fact is demonstrated by a close examination of solar training programs.

⁵⁸ Carley and Konisky. 569

⁵⁹ Carley and Konisky. 570

Solar Training Programs:

Until this moment, the research on solar training has been rooted in the just transition literature, and for this reason, the study of these programs has inherited some of the traditions of this field. In particular, the papers looking at solar training programs often focus only on how workers in fossil fuel industries can be retrained to work in solar jobs. Studies in the field have specifically focused on how workers in the coal industry can transition into solar work.⁶⁰ These studies covered a range of details surrounding this labor transition, including the feasibility and implementation of these solar training programs for coal employees, but failed to consider the opportunities for solar training programs outside of protecting fossil fuel workers who may potentially leave their jobs. Recognizing that this is an important task, and that academia and practitioners should work towards alleviating the transition whiplash for fossil fuel communities, it is still crucial to address considerations of equity and equality that this framing deemphasizes. Considering that 93.6% of coal miners are white,⁶¹ and there are disproportionately few employees in the solar industry who are Black,⁶² only studying how solar training programs can benefit mining communities through the just transitions framework may leave out some dimensions of justice. In this context, solar training programs appear to only

⁶⁰ Pai et al., “Solar Has Greater Techno-Economic Resource Suitability than Wind for Replacing Coal Mining Jobs”; Pearce, “An alternative to propping up coal power plants”; Bottino, “Retraining Programs for Coal Workers in Transition: Lessons from Appalachia”; Carley and Konisky, “The Justice and Equity Implications of the Clean Energy Transition”; Carley, Engle, and Konisky, “An Analysis of Energy Justice Programs across the United States”; Louie and Pearce, “Retraining Investment for U.S. Transition from Coal to Solar Photovoltaic Employment.”

⁶¹ McWilliams et al., “National Survey of the Mining Population Part I: Employees.” 31

⁶² The Solar Foundation, “US Solar Industry Diversity Study 2019.”

reinforce previous inequalities in the green labor market, rather than serving as an opportunity to address the inequity in the energy system and the workforce more broadly.

As noted above, until now, even though energy justice frameworks recognize that the distribution of green jobs must be studied as one of the benefits of the energy system, solar training programs have only been considered within the realm of the just transition literature. This is problematic considering that the goals of the energy justice literature and the just transition literature are not completely aligned. By exploring an urban solar training program not focused on workers leaving the fossil fuel industry, this paper examines how solar training programs can not only contribute to the goals of the just transition movement but can additionally serve to confront incumbent injustices in the energy system, as is the goal of the energy justice movement.

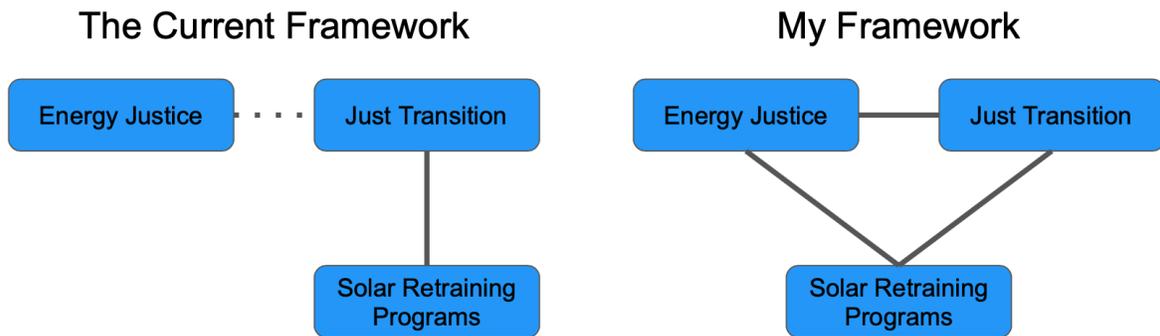


Figure 1: A comparison of the current conceptual relationships, as opposed to the proposed conceptual relationships

Methodology:

In this paper, I work to better understand what role solar training programs created by FEJA are playing in Chicago communities, how they affect the lives of the participants in the

program, and how the program fits with other services in different areas, or wraparound services, from the networks of nonprofits that run them. In the original round of FEJA funding, one program was created in the Chicagoland area, run by Elevate in collaboration with Faith in Place, Little Village Environmental Justice Organization, Safer Foundation, and Millennium Solar Electric Training Academy.⁶³ I focused on this program and the network of nonprofits that run it, to provide a case study for FEJA implementation in Illinois. I chose this solar training program both because the program seems to be broadly representative of the solar training programs created under FEJA, as they were all created with the same requirements, but as a contrast against programs in other regions because of the unique policy environment of Illinois, where FEJA has provided strong support to workforce development programs in the renewables sector. With a clear view of this case study, I work to understand how energy justice principles are being translated to this programmatic level, and the ways that this program and green labor intersect with broader social justice movements, to better understand how green labor can serve as a nexus for intersectional work that looks beyond a siloed approach to justice issues.

For this paper I rely on key stakeholder interviews. The solar training program I am studying is coordinated among a web of nonprofits, with little information available online regarding the inner workings and structure of the program. For this reason, I rely on those with firsthand knowledge of the program to inform me about how it operates. Understanding the inner working of this program is essential to my analysis. Those with knowledge of these facts

⁶³ “Future Energy Jobs Act Workforce Development Programs.”

include the administrators of the program across the range of the nonprofits that are involved. For my interviews, I both conducted interviews and relied on publicly available recorded interviews, whether in video or written format.

To conduct these interviews, I gathered an initial sample of stakeholders by email. I reached out to all organizations involved in administering this program and asked to be put in touch with an individual who was willing to interview for the project. Interviews were typically designed to last 40 minutes and to be conducted remotely.

I conducted the interviews over Zoom to ensure convenience and flexibility for the participants. Although I had a script to guide my questions, I also allowed the conversation to flow naturally and allowed for deviations from said script. This script integrated questions surrounding the Kirkpatrick Model, which is the most utilized model to study training programs, and focuses on evaluating reaction, learning, behavior, and results.⁶⁴ Beyond utilizing this model, I asked questions focused on the way that justice principles are applied to this program, how this program affects the lives of participants, how participants are funneled into the program, how the program interacts with other wraparound services, and other similar questions. The interviews that I conducted were recorded with participant consent, with an option for anonymity. My interview template is attached in the appendix.

After interviews were complete, I asked the interviewees if they had any contacts that they believed I should speak with and who would be willing to speak. This was to “snowball” my

⁶⁴ Kirkpatrick and Kirkpatrick, *Kirkpatrick's Four Levels of Training Evaluation*.

initial sample into a larger group. When they did have these contacts, I followed the same processes of reaching out and interviewing the stakeholders from my snowball sample as I did for the initial round of contacts.

In addition to this sample of interviews that I conducted, I also performed keyword searches in Google and YouTube, searching for the organization's names alongside keywords such as 'interview' and 'webinar'. This process turned up both written interviews, and recorded video interviews.

All the video and audio interviews were run through the Otter AI transcription service. I then analyzed the transcripts and written interviews, color-coding by theme and bolding or commenting on notable quotes. This coding allowed me to pull out common themes and trends across my data, which eventually formed the foundation for my results section. This methodology has been used successfully in past for case study projects, including those focused on solar training projects, and those focused on case studies in Chicago.⁶⁵ This suggests that this methodology is sufficient for interview projects with a small sample size focused on a specific case.

Ultimately, I conducted or collected 14 interviews of administrators who were involved in running this solar training program. These included interviews with 10 different

⁶⁵ Bottino, "Retraining Programs for Coal Workers in Transition: Lessons from Appalachia"; Ruby Rorty, "Is There a Legal Path to Environmental Justice? Movement-Building, Strategic Litigation, and a Case Study of Chicago's General Iron Dispute."

administrators at 4 organizations. This seems appropriate as research has suggested that after between 6-12 interviews, a saturation of themes occurs in interview-based data.⁶⁶

A range of strengths and weaknesses are present in my methodology. I had short contact times with my interviewees, only meeting each of them on one occasion for the interview. This increased the difficulty of building rapport. Additionally, this sample was a convenience sample, comprising the people who were easiest to reach out to. The stakeholders that were willing to sit down with a college student to talk about their work may not be representative of all stakeholder groups. This limits generalizability. Further, the use of prerecorded interviews, while allowing me to expand my sample, limited my ability to specifically direct the questions and focus of the interviews. Finally, my positionality as an interviewer likely affected the information that administrators were willing to divulge. One strength of my technique is that the qualitative interview methods may have been particularly successful in drawing out the perspective of the interviewees and highlighting their voices.

Table of Interviewees:

Name	Organization	Date	Performed by Author
Briana Parker	Elevate	10/21/2021	No
Christina Glaser	Faith in Place	2/21/2023	Yes
Christina Krost	Faith in Place	2/21/2023	Yes
Christina Krost	Faith in Place	11/9/2021	No
Christopher Williams	Millennium Solar Electric Training Academy	1/30/2023	Yes
Eya Lewis	Elevate	10/28/2021	No
Jose Hernandez	Elevate	9/15/2021	No

⁶⁶ Guest, Bunce, and Johnson, “How Many Interviews Are Enough?” 60

Jose Hernandez	Elevate	10/28/2021	No
Melissa Gombar	Elevate	2/27/2023	Yes
Naomi Davis	Blacks in Green	8/3/2020	No
Pastor Scott Onque	Faith in Place	10/21/2021	No
Pastor Scott Onque	Faith in Place	2/21/2023	Yes
Shirlondra Brooks	Elevate	5/8/2021	No
Shirlondra Brooks	Elevate	2/1/2023	Yes

Findings:

Turning to the data from my interviews, a range of themes appear. First, I explore how the solar training programs can have effects both on the participant, and the wider community. In the exploration of these effects, tension appears surrounding how administrators view careers in solar, and the data reveals a mechanism for community effects beyond the participant. Next, I explore the target groups of the program, and how the administrators who operate it ensure that the program is inclusive of these groups. This subsection explores how solar training programs intersect with other policy areas. Finally, I conclude by arguing that solar training programs, and the renewable sector at large, serve as a key site of imagining new futures for the energy industry.

Programmatic effects:

*“My parents are from Guanajuato Mexico. They came here in the late 80s and fortunately for me my father was given the opportunity to learn a trade. He’s actually an upholsterer... and that opportunity allowed us as a family to move forward and succeed. So, **I understand the importance of having something as essential as knowing a trade... I understand that that can be the difference between just barely making it and succeeding.** So I take every day in that sense where maybe this information can change someone’s life.”*

-Jose Hernandez, former program participant, current program administrator

*“I like being at the forefront of a growing industry and **I am confident** I can build a career and look forward to sharing my knowledge with the larger community.”*

-John Nuñez, former program participant⁶⁷

Throughout my data, the administrators of this program make clear the dramatic effects that solar training programs can have, both on individuals and on their communities at large. Regarding individuals, the data reveals the way that this program is trying to move away from narrow conceptions of a ‘good job’ or ‘living wage’ and is trying to move towards a more holistic understanding of what constitutes a successful and fulfilling career. At the community level, the data emphasizes a notion that the positive effects on individuals can ripple outwards, both towards families and communities generally, and to those in the same communities who want to enter the solar industry.

Individual effects:

Unsurprisingly, the administrators of this program are laser focused on the job prospects for graduates. As one of the administrators I spoke to at Elevate, Shirlondra Brooks, wrote in a blog post speaking about the training program, “The purpose of a good workforce development program is not just to provide training – it’s to provide training that leads to a good job.”⁶⁸ The program is carefully focused on how the participants can get jobs and build careers beyond the program. Eya Lewis, another administrator at Elevate focuses on the significance of this job creation, stating that the training program “is an opportunity for our

⁶⁷ “What’s New with FEJA Jobs Training?”

⁶⁸ Brooks, “Why Creating Solar Career Pathways Is Essential.”

community members to earn a living wage no matter what their background is, to learn a new skill that is transferable that they can take anywhere in the country and in the world.” Program participant-turned-administrator Jose Hernandez reemphasizes the significance of this opportunity and notes that “it’s such a great opportunity – it’s like, renewable infrastructure is such a big thing for the coming years. **Why wouldn’t you do something like this? It’s pretty much guaranteed job security.**” This secure employment is a significant and unique opportunity of the solar training program.

This emphasis on employment has been built into the structure of the program. The program concludes with a job fair, and speaking about one fair in particular, an administrator at Elevate states that it was “a hiring event hosted by Chicago company Livewire Construction, where thirty of Elevate Energy’s solar and construction partners from around the Chicago area recruited the program’s newly trained solar professionals.” Beyond this programming, the presence of an established solar developer (MSETA) in the nonprofit network that administers the program has allowed participants to rely on their connections for employment. Christopher Williams stated that he will “physically call companies and get these guys hired. **I personally make sure they get hired.**” Here, we can see the ways that Christopher leans on his own professional networks to secure employment. With both the inclusion of the job fair and the network of relationships MSETA offers, the employment outcomes of this program appear in part to have been a success. Although little data is available on the participants’ job prospects, in 2018, “the Chicago cohort graduated with a class of 21 individuals; 95% of graduates are now employed.” As Christopher Williams states, “I mean, honestly, you can say you came out of my program, not have a resume, [and] you're gonna get hired.”

With this focus on the employment prospects of program graduates, the administrators have thought seriously about what the employment should look like. Shirlondra Brooks emphasizes the importance of this examination, stating “conversations around workforce development need to recognize and reflect the unique nature of these roles and **emphasize jobs with good pay and benefits.**” Discussing other workforce development programs, Shirlondra states, “So when people tell them, they're gonna get training [and they] give you a [minimum wage] store job [where] you're gonna get 30 hours this week and 10 next week. That's not helping you to be self-sufficient.” She emphasizes that participants shouldn't only be looking for a position that allows them to survive but should aspire for a wage that gives them “what [they] need to be able to provide for [their] family, and plan vacations and things.” This inclusion of a category such as vacations moves away from the framework of a survival wage and center the focus “around family sustaining wages,” which highlights a vision beyond mere survival. This focus on moving past systems that provide solely survival wages has in part been built into the program with “the companies at the job fair [attached to the training program] were hiring for living-wage jobs, many of which were full-time and offered benefits.”

There does, however, seem to be some tension within the program about how this family sustaining wage can best be achieved. Shirlondra Brooks downplays the significance of a job in solar installation, stating “Solar installer... jobs are usually categorized as non-traditional... schedules are not 9-5 and the job site locations can vary from week to week... existing data shows that pay ranges from \$11.50 to \$21.00 per hour.” She further elaborates on this point in our interview, asking “**what is the career pathway in solar?** If I'm going to be an installer, what else can I be? Or should I be? There's an offseason in that work, how do I kind of keep money

rolling in?” In many ways, there seems to be some hesitation to focus on creating jobs as solar technicians, for fear that these jobs do not sufficiently provide the family supporting or living wages discussed earlier. Eya Lewis emphasizes the need to look beyond the scope of just solar installation jobs, stating that **“there are so many options as far as what your career path will be within the clean energy economy** so if you're like me don't want to get on a roof there are other options for you that are available: anything from sales to office management to project management and the list goes on and on.” At times, the administrators seem to focus not on the opportunities in solar installation, but rather on how individuals could pivot their careers.

Although one participant frames the range of opportunities presented as merely being given “insight on different avenues we could take in the field of sustainability and green energy,” this focus contrasts against others who emphasize the opportunities in solar installation. Jose Hernandez notes, “I earned my OSHA-10 and NABCEP PV Associate certifications through the program. Having those two really adds to your value. And being a Future Energy Jobs Act (FEJA) solar graduate is a really big plus right now.” He focuses on his certification to work as an installer as a significant resource. Similarly, Pastor Scott Onque of Faith in Place notes his pride in seeing “people after a 10-12 week program to come out as solar technicians and now we see **those same individuals climbing roofs installing our solar panels making a livable wage.**” Christopher Williams of MSETA seems to believe that there are real opportunities for career growth as an installer, stating that **“I'm teaching them how to be a foreman.”** Even though the program has built out structures that have encouraged strong employment numbers, and despite the fact that that there seems to be a strong emphasis on creating robust jobs that will transition people into long term financial security, it does not

seem that a clear viewpoint has coalesced regarding how to make that happen. Although some believe that solar installation should not be the focus moving forward, and instead programs should turn towards other career paths in the solar industry, others seem to believe that the program can be structured, in conjunction with state policy, to allow thriving long-term careers in solar installation. This tension could present problems for the program, if these two competing impulses pull in opposing directions, as it ties into the underlying motivation for the project.

Ultimately, this tension could be the result of some challenges that the training program faced. Pastor Onque notes that with the FEJA training program, “Even though there are some speakable successes with folks that came out of training... **there weren't enough projects to really keep a workforce employed.**” Despite FEJA being very successful in training individuals, there were challenges with ensuring that there were sufficient high-quality jobs in solar. The ICJC attempted to learn from these failures as they drafted the CEJA legislation. Pastor Onque emphasizes that “A couple of things had to happen in the CEJA plan that was different. We had to make sure that we built in incentives for the hiring companies to hire those that are coming out of training.” Additionally, he notes how the CEJA plans to expand the renewable energy industry in Illinois would help to contribute many projects for the trainees, and that there were provisions in the new bill to ensure these jobs pay family-supporting wages. Melissa Gombar concurs that creating “the market pull, making sure that employers are creating the space for the trainees to actually receive employment” was a key focus of CEJA. Although there may have been some challenges with creating fulfilling employment out of the current training program, it seems that this obstacle will be overcome with CEJA.

The administrators of the FEJA program are intensely focused on the opportunity for their trainees to receive good jobs with family-supporting wages after they graduate. There is, however, tension about how this could best be achieved, whether in solar installation or in other specialties. This tension may be the result of discomfort with feelings of incomplete success in terms of the jobs that FEJA graduates were able to secure. The administrators I spoke to did, however, seem confident that these obstacles would be largely eliminated with CEJA, where workforce development will be tied to job-creating investment in renewables.

Community effects:

These benefits are not only experienced individually by the person who receives the job because of this program, but can further impact those surrounding the trainee. This positive impact is experienced first as a benefit to those connected to the job holder. As seen at the top of this section, Jose Hernandez discusses the ways that a job in the trades can uplift an entire family, saying of his father's job, "that opportunity allowed us as a family to move forward and succeed." There is first a direct spillover effect to the families of these individuals. Next, there is a wider community effect. Eya Lewis discusses how "it's about uplifting the entire community... it's an example that serves for others to see that it is absolutely possible; that they can go from whatever their situation is into a space that not only uplifts their community but is something that they can be proud of, and they can in turn contribute back to the community that they live in." Pastor Onque agrees with this point, explaining how "**we could actually lift the economic conditions of those communities, because the job does a whole lot...** and a working community actually lift the whole community." Graduates of these programs can reinvest in their own communities with the wealth that they build or can merely serve as a role model for

the people around them. In that way, the positive effects of solar training program expand past the individual and begin to perhaps be felt by those around them.

Throughout the interviews, one particular route through which this training program could affect a wider community is often highlighted. It became apparent that this program could serve the important role of creating a professional network in the communities that it targets. Shiriondra discusses how this was in part designed, with the creation of a “Job Club to create a space for sharing job leads and employment information... This space fosters an ongoing network of solar industry professionals that the students can tap into whenever they need it.” This aspect of the program works formally to create this network. But the work was also being performed informally. Because the program is run through a network of nonprofits, there are contractors involved in running the program, and contractor incubators that target contractors from historically marginalized backgrounds. Christopher Williams, a contractor involved in running the program, discusses how he “employed about 15 to 20 [graduates] on a project... in Chicago, which was the micro grid in Brownsville.” Similarly, the contractor development program tries “to capture those diverse contractors that are traditionally left out of the clean energy economy and market and help them gain skills gain certifications and gain the confidence to operate within the clean energy economy.” Eya Lewis tells the story of one contractor that they helped and how he “has never once forgotten where he came from” and she elaborates saying, “I hope that the individuals that we have touched through our training program for solar decide that they will be business owners and grow enough to **hire other trainees that are coming through the program as well.**” These programs are designed with the hope that participants stay connected to the program and can serve as a resource for future

graduates. Through the professional networks that it creates, this training program can have ripple effects through communities, allowing more members of the community to enter the solar industry through these connections.

This could play a significant role in changing the landscape of the solar industry. As was discussed in the background section, there seems to be a divide in how different groups enter the renewables industry. White employees typically find their positions in the solar industry through personal connections and word of mouth, while people of color in the industry do not have the same access to these networks.⁶⁹ People of color primarily find their jobs in the solar industry through job fairs and training programs, rather than through their social and professional networks.⁷⁰ As Naomi Davis of Blacks in Green states, “People really need to be able to see it to understand it. There’s no background of obviousness and there’s no cohort that’s walking around these communities demonstrating what’s possible in the new green economy.” The creation of new professional networks in the target communities, including communities of color, can multiply the effects of these programs, allowing more individuals to be brought into the renewables industry than just those who make it through the official solar training program. Members of historically marginalized communities will now have similar access to professional networks in the industry. In this way, the creation of these professional networks can allow the effects of the training program to ripple beyond the individual.

⁶⁹ The Solar Foundation, “US Solar Industry Diversity Study 2019.” 10

⁷⁰ The Solar Foundation. 10

Intersectionality:

*“So my mission and vision was always to train minorities in solar and electrical contractors who are involved in solar because I knew one day, **we was going to be looking at a market from the outside looking in** and saying, Hey, when did this happen?”*

- Christopher Williams, Program Administrator

The administrators speak passionately about who the solar training program serves, and how they work to serve these groups. The groups that this program targets, and the resources that must be leveraged to include these target groups, demonstrate how solar training programs in a non-rural setting can intersect with other policy areas and serve as a key catalyst for intersectional energy justice work, that looks beyond the energy system at food security, care economies, wealth inequality, and many more areas.

Target Groups:

Throughout the data I examined, it is clear that the interview participants are incredibly proud of who their program served. Christopher Williams discusses his motivations for focusing on minority communities, stating, “if the African American and minority community is not involved, **they will be left behind, almost like decades is behind.**” Briana Parker of Elevate concurs with these points, stating, “I’m excited about the diverse hiring and black and brown contractors getting to the table and actually getting jobs and making money for their communities.” Eya Lewis reemphasizes this same point, saying “I feel in my heart that workforce development is about investing, and in some cases reinvesting, into under resourced communities.” Pastor Onque even imagines how the program could be made even more seamless for formerly incarcerated individuals, discussing how they “are also looking at job

training for returning citizens and they don't have to wait until they get out of a prison to start training. Training will actually happen inside the walls of the prison.” There seems to be real investment in targeting historically marginalized groups for inclusion in this program.

But there do seem to be inconsistencies at moments with how this inclusiveness is discussed. Christopher Williams mentions how when he designed the program, he hadn't originally intended to serve justice involved persons and those exiting foster care. As he puts it “I didn't originally set out to build a second chance program.” He states that he wasn't aiming to serve these groups, but, in his words, “I don't discriminate on anyone. It's not a requirement, of course, to be a troubled individual, we just don't turn them away.” Shirlondra Brooks also leans into some of this rhetoric of nondiscrimination, stating “We really want to be intentional about serving BIPOC communities. But... **equity is not leaving anyone out.**” Here, these administrators, who at other moments emphasize their pride in actively targeting underserved communities, lean into a framing of their program merely as nondiscriminatory. In doing so they in part soften the emphasis of their program as targeting these communities.

Screening In:

There is also an interesting perspective shift in this program, where the administrators heavily emphasize the role of ‘screening participants in’ to the program rather than screening them out. I am borrowing this term from an administrator, Shirlondra Brooks, who states, “we think about **screening individuals in as opposed to out...** if you're reading at a sixth-grade level, this training may not be a good fit right now. But **let's work with a tutor to get you there.** So that... you're able to access it, and then you're able to be successful with advanced career pathways.” Screening participants in rather than out shifts the impetus for breaking down

various obstacles onto the program rather than the participants. Instead of excluding those who are not able to participate, screening in looks to understand what resources all individuals need to be given to succeed. Shirlondra offers another example, explaining, “we're seeing that people have food insecurities, and that they're unable [to apply]. it's a difference between saying, oh, you're eligible for some food stamps, go apply? Versus okay... What can expedite this service for me?” Once again, the program focuses on addressing challenges with food security that participants may face, rather than letting the burden remain on the shoulders of the participant. Pastor Onque also emphasizes this focus, stating that “we want to make sure that the wraparound services are included to make sure people were successful in getting through the training.” Jose Hernandez, a former participant in the program, seems to notice this effort to screen in, saying “It can be intimidating because it’s a technical program. But **they... go above and beyond to make sure no matter what you succeed.**” Here, Jose emphasizes the programs conscious effort to be inclusive and allow all participants to succeed in the program.

This screening in is necessary, because of the significant barriers that participants can face in the program. As mentioned earlier, literacy and numeracy can be barriers in addition to food insecurity. Christopher Williams lists off some of the many obstacles that his trainees face, “Like childcare for the women who may want to come out... Rehabilitation. Sometimes conflict resolution... And a lot of the guys haven’t been working so they don't have money to get back and forth. They don't have money to buy tools.” Shirlondra Brooks emphasizes the role of pay in particular to create inclusiveness, noting that “**stipends need to mirror the actual wages** that a person is expecting to make post training because if you're putting someone in a 16-week

training, you're saying, and guess what I'm going to you \$500... They're going to be like I can't do this." Pastor Scott Onque notes how these services were focused beyond the completion of the program, with some trainees receiving help on "how to maintain your employment because you don't just [need to] get a job, but you have to [teach] people about being responsible about a job." As Shirlondra notes, creating this inclusive program has been a learning process, and they have "modified workshops using topics that students have identified as barriers to employment including financial literacy, money management, childcare, and mental health based on student feedback." This process of integrating feedback on how the program can better support trainees has allowed administrators to build a more inclusive program.

Christopher Williams suggests some possible causes of this distinct emphasis on inclusivity. At times, he states that the positionality of the organizations that run this program allowed for its success. Speaking about other training programs he's seen, he notes, "So they're looking for just somebody to carry a toolbag, and I'm teaching them how to be a foreman." And he further elaborates that: "**they don't understand the barriers that the Black and Brown individual was going through...** In order to deal with the economic crisis in our community, **you need a local presence** because we understand what's going on." Here, Christopher seems to connect the success of his program with an awareness of the challenges and barriers that underserved communities faced. He claims that these barriers can only be recognized by those positioned within or close to those communities. This suggests that the inclusiveness seen in this program is made possible by the organizations' close ties to the Chicago communities that they are serving. This idea was supported in my conversation with Melissa Gombar. Although she more specifically focuses on inclusion in the job market after training, her sentiment was

similar when she states “a lot of our contractors come from historically marginalized communities, and... they share lived experiences... **if you share a lived experience, and you can understand where someone's background is, and where they're coming from, it's more successful all around.**” Christopher also mentions the importance of having a large network of collaborators for breaking down barriers to inclusiveness, stating, “You know, we didn't have OSHA in the budget. I paid for it out of my pocket... Faith in Place came out of pocket and bought ties for the students. For graduation and books, Elevate found stipend money to cover stipends... And that was the beauty of having so many partners on that one ticket. Whatever was lacking, we made it happen.” The large network of collaborators allows each organization to draw upon their resources to solve the problems that they knew how to or had the capacity to solve. The careful attention to inclusivity is a key focus, and the positionality of the organizations that led the program, alongside the collaborative nature of the administration, may help to encourage inclusiveness.

Imagined Futures:

One of my later interviews was conducted with Melissa Gombar, and her discussion around solar training programs helped to crystalize and intertwine the themes that had been running through the rest of my data. Speaking about the importance of solar training programs, Melissa emphasizes the role of imagination and newness. She states, “traditional construction businesses... have very strong operating procedures and ways of being... And so quite frankly, there's been a lot of challenges for both women, and black and brown folks to integrate into traditional construction-based companies... with these new emerging technologies, **the number of possibilities that exist for newness** is really cool.” Here, Melissa emphasizes a key fact about

the renewables industry. Because the industry is emerging so rapidly, it does not have entrenched forms and systems. As Melissa frames it, “it's newer, and there's so much funding, and **there's so much opportunity.**” The renewables sector presents a key chance to build an industry that is unlike others. Melissa emphasizes this point with (fittingly) a construction metaphor, noting, “it's like new construction versus retrofitting a home. Retrofitting a home is trying to integrate folks into industry that's already very set in its ways. New construction is getting folks into the clean energy economy, because there's not a lot of pathways that have already been set.” As a ‘new construction,’ the renewables industry can be built with a sounder foundation that is explicitly focused on equity and justice principles. Melissa highlights how the “growth that’s projected” in a space that isn’t “historically laden” presents “a lot of opportunity.” This discussion recast my previous interviews in a new light. Melissa opened up the possibility that solar training programs can serve as a radical site of imagination for the renewables industry, where there exists a chance to create a unique space.

This opportunity for imagination can be seen in the way the ICJC went about crafting FEJA and CEJA, where, as Pastor Onque notes, they “went to individuals and said, Hey, **if you were being trained for a job, what things do you need to be successful?** We took that information back and helped craft some of the wraparound services.” This program is an opportunity for consumers and those who would be trained to imagine how they hope the industry will be shaped. It gives the opportunity for input and creating a program in the vision of those it serves.

And more broadly, each effort at inclusion and at creating sound job prospects and professional networks is an act of imagination. When Pastor Onque discusses how he designed

the program to “invite [formerly incarcerated persons] to the table so that they will be able to train without having to hide from their paths,” this is an act of imagining an industry that is inclusive of this group. The emphasis on ‘screening in’ is an imagination of an industry unlike those that exist presently that actively works to include marginalized groups. And the emphasis on job opportunities is an imagination of an industry that allows black and brown communities to build intergenerational wealth and access jobs with family supporting wages. Solar training programs, because of the massive investment in the renewables industry, can help to reimagine the job sector as one with a unique focus on equity and justice, a project that will serve to benefit many individuals and communities.

Conclusion and Recommendations:

Throughout the data examined in this paper, multiple themes and trends appear. It is apparent that there remains some fracturing in how the administrators see careers in solar installation. There is disagreement regarding the long-term prospects and sustainability of jobs working as a solar installer, possibly because of disappointing job outcomes under FEJA. Simultaneously, however, the data reveals that the effects of the program do not stop with those who received training, and instead rippled outward. In particular, the creation of social and professional networks in the solar training field multiplies the impact of the training program. Looking at who the program serves, it is apparent that the program serves a diverse selection of participants. This is made possible by conscious efforts at inclusiveness, and wraparound programming to assist the program participants and minimize their barriers to participation. The positionality of the organizations who administer the program may play an important role in allowing for this inclusivity in the program. Ultimately, I argued that these

solar training programs play an essential role in allowing the rapidly growing renewables industry to be reshaped in a more equitable and inclusive manner.

The positive effects of the program demonstrate the importance of considering non-rural solar training programs when examining green labor. It is obvious that key sites of energy justice work around green jobs will occur in urban and suburban areas where historically excluded groups in the energy system can be brought into the conversation. These programs also intersect with a range of other injustices beyond the energy system. This means that the programs can serve to connect the energy justice movement back into wider justice efforts.

This research serves as a preliminary examination of solar training programs in a non-rural setting, introducing them into the literature. Further research is still needed, however, to fully understand these tools. Although stakeholder interviews provide a valuable perspective on the programs, and offer many insights into their design and effects, further qualitative study would be helpful. In particular, an ethnography performed during the course of a training program or an interview project speaking directly with the participants in one of these programs may offer valuable insight into the effects and design of the program that wasn't available only through the perspectives of administrators. Additionally, quantitative study on the effects of these programs could be a useful tool to advocate for these programs in a policy design context. Finally, it may be beneficial to study these programs in a direct contrast with rural solar training programs, to get a better sense of how the two programs differ in their goals and structure. These further routes of study will expand researchers' understanding of solar training programs in non-rural communities and allow for the continued examination of the intersection of labor, the transition away from fossil fuels, and other policy areas.

This research may also have important implications for policymakers interested in solar training programs. First, the paper demonstrated the dramatic impacts that these solar training programs can have in non-rural contexts. This should hopefully serve to motivate policymakers to implement these programs in regions where they do not exist thus far. Second, the research explored the tension apparent in this program between those who hope to create meaningful and well-paid solar installation jobs, and those who see these training programs as a steppingstone into other career paths. Policymakers must either implement legislation to improve the prospects for solar installers or work to understand what this transition to other career paths may look like. Here in Illinois, the programs implemented under CEJA must be monitored to understand how they approach this task. Third, interviews revealed the importance of this policy as a tool to confront challenges in the foster care system and the prison system. Policymakers must continue to think intersectionally about environmental policy and ensure that they are collaborating between policy fields to address multiple issues simultaneously. Finally, the paper explored the many barriers that workers face when entering these solar training programs. There must be sustained effort both in Illinois and in other states to implement similar programs to ensure that these programs continue exploring ways to be inclusive and 'screen in' rather than screen out.

Acknowledgements:

This research would not have been possible without Chad Broughton, who introduced me to qualitative methods and provided valuable mentorship as an advisor. I would also like to thank the professors and preceptors who guided me through the research process and provided invaluable feedback throughout, including Raymond Lodato, Xixi Jiang, Christopher Kindell, Kristi Del Vecchio, and Daniel Sonnenstuhl. Finally, thank you to my peers in the Environmental Studies BA Thesis colloquium, who helped to refine my research, slogged through my early drafts, and supported me throughout the process.

Appendix:

Interview Script:

Subjects will be asked a series of open questions surrounding the solar training program. This interview script will serve as a guideline, and I will allow the conversation to flow naturally.

- What was your professional journey to working for [insert organization]?
 - Could you tell me a bit about your role at [insert organization]?
 - How would you describe your organization's core mission?
 - What role does your organization play in running solar training programs?
 - What role has your organization played in policy advocacy around solar training programs?
- The website mentions you help lead [insert task], what does that look like?
 - How does your role fit in with the solar training program?
- How does your organization engage with trainees/clients?
 - How are clients funneled into your organization?
 - Who is the typical client?
 - What does the typical training program look like that your organization works on?
 - What do you hope that trainees gain from the program? Do you think they achieve these goals? What does success look like in your mind?
 - What role do these programs play in the lives of participants?
 - What other organizations do you work with? What does that collaboration look like?
 - Is the training linked in with other services?
- What is the importance of this solar training program? Why does your organization put energy into it?
 - How would you understand justice in the context of the work that you do?
 - What do you see as your mission? How would you say this solar training programs achieves the missions of your organization?
- What kind of outreach work did you/your organization do with the state/local government? What brought you to working on advocacy around CEJA/FEJA and workforce development?
 - What were some of the flaws in FEJA that you were hoping to remedy with CEJA?
- How does the solar training program interact with other services that your nonprofit offers?
 - Is it typical for clients to receive benefits from multiple services?
- If you had a magic wand and could make one change in relation to energy justice or this program here in Chicago, what would it be?
- Is there anything else that you want to tell me that we haven't covered?
- Why solar training? Why not some other workforce development

Works Cited:

1. Auffhammer, Maximilian, Patrick Baylis, and Catherine H. Hausman. "Climate Change Is Projected to Have Severe Impacts on the Frequency and Intensity of Peak Electricity Demand across the United States." *Proceedings of the National Academy of Sciences of the United States of America* 114, no. 8 (February 21, 2017): 1886–91. <https://doi.org/10.1073/pnas.1613193114>.
2. Borenstein, Severin, and Lucas W Davis. "The Distributional Effects of US Clean Energy Tax Credits," n.d., 44.
3. Bottino, Tiziana. "Retraining Programs for Coal Workers in Transition: Lessons from Appalachia." Johns Hopkins University, 2018.
4. Bouzarovski, Stefan, and Neil Simcock. "Spatializing Energy Justice." *Energy Policy* 107 (April 2017). <https://doi.org/10.1016/j.enpol.2017.03.064>.
5. Brooks, Shirlondra. "Why Creating Solar Career Pathways Is Essential." Elevate, May 8, 2021. <https://www.elevatenp.org/workforce/why-creating-solar-career-pathways-is-essential/>.
6. Carley, Sanya, Caroline Engle, and David M. Konisky. "An Analysis of Energy Justice Programs across the United States." *Energy Policy* 152 (May 1, 2021): 112219. <https://doi.org/10.1016/j.enpol.2021.112219>.
7. Carley, Sanya, and David M. Konisky. "The Justice and Equity Implications of the Clean Energy Transition." *Nature Energy* 5, no. 8 (August 2020): 569–77. <https://doi.org/10.1038/s41560-020-0641-6>.
8. Center for Climate and Energy Solutions. "Renewable Energy." Accessed December 3, 2022. <https://www.c2es.org/content/renewable-energy/>.
9. Elevate. "What's New with FEJA Jobs Training?," February 8, 2019. <https://www.elevatenp.org/policy/whats-new-with-feja-jobs-training/>.
10. Energy.gov. "Solar Training Network." Accessed December 5, 2022. <https://www.energy.gov/eere/solar/solar-training-network>.
11. Gambhir, Ajay, Fergus Green, and Peter Pearson. "Towards a Just and Equitable Low-Carbon Energy Transition." *Grantham Institute Briefing Paper*, no. no 26 (August 2018).
12. Guest, Greg, Arwen Bunce, and Laura Johnson. "How Many Interviews Are Enough?: An Experiment with Data Saturation and Variability." *Field Methods* 18, no. 1 (February 1, 2006): 59–82. <https://doi.org/10.1177/1525822X05279903>.

13. Healy, Noel, Jennie C. Stephens, and Stephanie A. Malin. "Embodied Energy Injustices: Unveiling and Politicizing the Transboundary Harms of Fossil Fuel Extractivism and Fossil Fuel Supply Chains." *Energy Research & Social Science* 48 (February 1, 2019): 219–34. <https://doi.org/10.1016/j.erss.2018.09.016>.
14. Heffron, Raphael J., and Darren McCauley. "The Concept of Energy Justice across the Disciplines." *Energy Policy* 105 (June 1, 2017): 658–67. <https://doi.org/10.1016/j.enpol.2017.03.018>.
15. Hernandez, Diana, Yumiko Aratani, and Yang Jiang. "Energy Insecurity among Families with Children," 2014. <https://doi.org/10.7916/D89G5JX8>.
16. IEA. "Renewables 2021 - Analysis and Forecast to 2026." IEA, 2021.
17. Illinois Clean Jobs Coalition. "Climate and Equitable Jobs Act Overview," November 2021. <https://icap.sustainability.illinois.edu/files/projectupdate/7353/Climate%20and%20Equitable%20Jobs%20Act%20Overview%20November%202021%20Final%20%28notes%29%20%282%29.pdf>.
18. Illinois Solar Energy Association. "CEJA FAQ." Accessed February 4, 2023. <https://www.illinoissolar.org/CEJA-FAQ>.
19. Illinois Solar Energy Association. "Future Energy Jobs Act Workforce Development Programs." Accessed February 4, 2023. <https://www.illinoissolar.org/FEJA-Workforce-Development-Programs>.
20. Illinois Solar for All. "Job Training." Accessed December 5, 2022. <https://www.illinoissfa.com/job-training/>.
21. IRENA and ILO. "Renewable Energy and Jobs: Annual Review 2022,." Geneva and Abu Dhabi: International Renewable Energy Association and International Labor ORganization, n.d.
22. Jenkins, Kirsten E. H., Benjamin K. Sovacool, Niek Mouter, Nick Hacking, Mary-Kate Burns, and Darren McCauley. "The Methodologies, Geographies, and Technologies of Energy Justice: A Systematic and Comprehensive Review." *Environmental Research Letters* 16, no. 4 (March 2021): 043009. <https://doi.org/10.1088/1748-9326/abd78c>.
23. Jenkins, Kirsten E.H., Jennie C Stephens, Tony G. Reames, and Diana Hernández. "Towards Impactful Energy Justice Research: Transforming the Power of Academic Engagement." *Energy Research & Social Science* 67 (September 2020). <https://doi.org/10.1016/j.erss.2020.101510>.

24. Jenkins, Kirsten, Darren McCauley, Raphael Heffron, Hannes Stephan, and Robert Rehner. "Energy Justice: A Conceptual Review." *Energy Research & Social Science* 11 (January 1, 2016): 174–82. <https://doi.org/10.1016/j.erss.2015.10.004>.
25. Kaswan, Alice. "Greening the Grid and Climate Justice." *Environmental Law* 39, no. 4 (2009): 1143–60.
26. Kirkpatrick, James D., and Wendy Kayser Kirkpatrick. *Kirkpatrick's Four Levels of Training Evaluation*. Association for Talent Development, 2016.
27. Louie, Edward P., and Joshua M. Pearce. "Retraining Investment for U.S. Transition from Coal to Solar Photovoltaic Employment." *Energy Economics* 57 (June 1, 2016): 295–302. <https://doi.org/10.1016/j.eneco.2016.05.016>.
28. McCauley, Darren, Raphael Heffron, Hannes Stephan, and Kirsten Elizabeth Harrison Jenkins. "Advancing Energy Justice : The Triumvirate of Tenets and Systems Thinking," 2013. <https://research-repository.st-andrews.ac.uk/handle/10023/6078>.
29. McWilliams, Linda Jansen, Patricia J Lenart, Jamie L Lancaster, and John R Zeiner. "National Survey of the Mining Population Part I: Employees," n.d., 266.
30. Paddock, Leroy. "Energy Efficiency and Distributed Solar Energy Targeted to Underserved Communities: Perspectives on the Illinois Future Energy Jobs Act." *SAN DIEGO JOURNAL OF CLIMATE & ENERGY LAW* 11, no. 79 (2020): 79–96.
31. Pai, Sandeep, Hisham Zerriffi, Jessica Jewell, and Jaivik Pathak. "Solar Has Greater Techno-Economic Resource Suitability than Wind for Replacing Coal Mining Jobs." *Environmental Research Letters* 15, no. 3 (March 1, 2020): 034065. <https://doi.org/10.1088/1748-9326/ab6c6d>.
32. Pearce, Joshua M. "An alternative to propping up coal power plants: Retrain workers for solar," August 23, 2018. <http://119.78.100.173/C666//handle/2XK7JSWQ/122117>.
33. Pellegrini-Masini, Giuseppe, Alberto Pirni, and Stefano Maran. "Energy Justice Revisited: A Critical Review on the Philosophical and Political Origins of Equality." *Energy Research & Social Science* 59 (January 1, 2020): 101310. <https://doi.org/10.1016/j.erss.2019.101310>.
34. Ruby Rorty. "Is There a Legal Path to Environmental Justice? Movement-Building, Strategic Litigation, and a Case Study of Chicago's General Iron Dispute." The University of Chicago, n.d.
35. Schroeder, Dennis. "Clean Jobs America 2021: AFTER HARD YEAR, PROMISE OF UNPARALLELED JOBS GROWTH," n.d., 29.

36. Shepherd, Cindy. "Future Energy Jobs Act." University of Illinois, n.d.
https://www.istc.illinois.edu/UserFiles/Servers/Server_427403/File/Shepherd_FEJA.pdf.
37. "Solar Program | LVEJO." Accessed December 5, 2022. <http://www.lvejo.org/solar-program/>.
38. Sovacool, Benjamin K., Matthew Burke, Lucy Baker, Chaitanya Kumar Kotikalapudi, and Holle Wlokas. "New Frontiers and Conceptual Frameworks for Energy Justice." *Energy Policy* 105 (June 1, 2017): 677–91. <https://doi.org/10.1016/j.enpol.2017.03.005>.
39. The Solar Foundation. "US Solar Industry Diversity Study 2019," n.d.
www.TheSolarFoundation.org/diversity.
40. USGCRP. "Fourth National Climate Assessment." U.S. Global Change Research Program, Washington, DC, 2018.
<https://nca2018.globalchange.gov><https://nca2018.globalchange.gov/chapter/4>.
41. Walker, Gordon, and Rosie Day. "Fuel Poverty as Injustice: Integrating Distribution, Recognition and Procedure in the Struggle for Affordable Warmth." *Energy Policy*, Special Section: Fuel Poverty Comes of Age: Commemorating 21 Years of Research and Policy, 49 (October 1, 2012): 69–75. <https://doi.org/10.1016/j.enpol.2012.01.044>.
42. Welton, Shelley, and Joel Eisen. "CLEAN ENERGY JUSTICE: CHARTING AN EMERGING AGENDA." *Harvard Environmental Law Review* 43 (n.d.): 66.