ENERGY AND EQUITY IN THE TWIN CITIES WORKSHOP

Summary Report

INSTITUTE ON THE
ENVIRONMENT
UNIVERSITY OF MINNESOTA
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Thank You

Many thanks to our partners for their hard work and dedication, without which none of this would be possible. This guide was written by Heidi Ries, Edwin Nelson, and Gabriel Chan. The issue briefs (included in the Appendix) were written by Matthew Grimley and reviewed by Heidi Ries, Gabriel Chan, Olivia Schares, and Melissa Kenney. Megan Guerber led the editing and review process both for the Final Report and the issue briefs. Sean Quinn designed the issue briefs. Todd Spichke designed the Final Report.

Thank you to our Project Partner, the Robert J. Jones Urban Research and Outreach-Engagement Center (UROC), for helping to curate the workshop's content.

A special thanks to the entire workshop development team: Gabriel Chan, Heidi Ries, Edwin Nelson, Melissa Kenney, Kimberly Long, Choua Xiong, Jen Afamefune, Olivia Schares, and Grace Abifarin. Additionally, the workshop ran smoothly due to the strategic facilitation of Edwin Nelson, technical and communications support by Kimberly Long, and breakout team leads: Anna Giesting, Bhavin Pradhan, Chris Carter, Jack Moebius, Mark Teklinski, Matilde Pratas Fernandes, Mattie Anders, Nathan Twardock, and Sarah Komoroski. Thank you to the workshop keynote speaker Shalanda H. Baker, Deputy Director for Energy Justice in the Office of Economic Impact and Diversity at the U.S. Department of Energy.

We would also like to thank the Workshop's Advisory Board for their guidance, devotion, and leadership on this project: Metric Giles, Bill Grant, Sam Grant, Annie Levenson-Falk, Ben Passer, and Nick Martin.

The Energy and Equity in the Twin Cities Workshop is part of the Minnesota's Clean Energy Future series, launched in 2019. The funding for this workshop and the incubation projects were made possible through generous support from the McKnight Foundation and the University of Minnesota's Institute on the Environment; the Clean Energy Future series was also supported by Xcel Energy.

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Introduction

How the energy system impacts the lives of Minnesota households varies significantly based on race, income, geography, housing quality, access to infrastructure, and broader historic patterns of injustice.

Energy burden, the percentage of household income spent on non-transportation energy use, is one indicator of how the energy system impacts lives. In Minnesota, the average household energy burden is 2 percent, which is below the national average. Yet Minnesotans living below the Federal Poverty Level carry an average energy burden of 16 percent – an eightfold increase.

The effect of a high energy burden on one's wellbeing is multifold: Households with higher energy burdens are more likely to face disconnections from electric and gas services, as well as face tradeoffs between being able to afford energy and being able to afford other basic necessities, such as food, medicine, or transportation.

Numerous federal, state, and local policies and programs aim to address the persistent disparities *caused* by the energy system by expanding opportunities *through* the energy system. These efforts target household energy insecurity, unequal access to energy efficiency and clean energy, and the diversity of the workforce in the energy sector, among other issues.

In the coming decade, the energy system is likely to undergo a radical transformation from fossil fuel to clean energy technologies in response to climate change. That makes now a critical time to ask: **How can we, starting in our own communities, leverage the opportunity created by this transition to effectively recognize and respond to energy injustices?** Failing to recognize current injustices in the energy system risks building an energy future that replicates or exacerbates injustice.

The Energy and Equity in the Twin Cities Workshop, jointly convened in November 2021 by the University of Minnesota's Institute on the Environment (IonE) and Robert J. Jones Urban Research and Outreach-Engagement Center (UROC), fostered dialogue, collaboration, and new partnerships to drive local solutions promoting energy justice.

The workshop sought to engage Twin Cities organizations and communities that historically have been excluded from conventional energy policy convenings, which tend to cater to established experts rather than community leaders such as activists, artists, and storytellers. It also sought to engage those working to address household wellbeing and security.

More specifically, the workshop aimed to advance conversation, connection, and solutions to energy injustice by building bridges between the still largely distinct fields of clean energy policymaking and frontline community advocacy.

The workshop had two desired outcomes:

1. Participants reach a shared understanding of the intersections of energy and equity and progress toward long-term community empowerment for those most impacted by energy system costs, disconnections, and pollution.
2. That participants foster new collaborations by facilitating "solutions teams." Emerging through structured activities during the workshop, these teams included a mix of academic and non-academic participants, who were drawn together by shared goals and ideas to create a project addressing one aspect of energy insecurity in the Twin Cities. At the conclusion of the workshop, these teams were invited to apply for IonE grant funding to further develop their projects [Proposals & Awards, page 17].

Following the workshop, the convening University of Minnesota organizations remain involved with participants in continuation of our community-engaged work on energy justice.

WORKSHOP PARTICIPATION

45 total participants attended two or more workshop sessions.

29 participants joined at least one project team during the workshop.

60 percent of participants continue working on collaborative project teams.

Note: These numbers do not include the workshop planning team.

Session Reviews

Introduction

The Energy and Equity in the Twin Cities Workshop was held remotely over four consecutive weeks in fall 2021. The convening brought together a valuable network of members of justice and advocacy organizations, community-based organizations, energy-assistance programs, labor-focused groups, housing-focused groups, equity-focused energy developers, utilities, state and local government, and academia to collectively identify – and propose solutions to – the challenges of energy injustice.

Including the planning team, more than 50 people participated in the workshop.

Preparations included:

- Engaging a six-person advisory board to help design the workshop, with representatives from utilities, climate justice, utility advocacy, energy assistance, and housing groups. The advisory board was comprised of:
  - Metric Giles, **Community Stabilization Project**
  - Bill Grant, **Minnesota Community Action Partnership**
  - Sam Grant, **Rainbow Research** (formerly of MN350)
  - Annie Levenson-Falk, **MN Citizens Utility Board**
  - Ben Passer, **McKnight Foundation** (formerly of Fresh Energy)
  - Nick Martin, **Xcel Energy**
- Preparing ten issue briefs to provide background knowledge and shared terminology for workshop participants.
- Publishing a Google Site with a list of participants, the workshop's schedule, session summaries, and information on funding opportunities for workshop participants.
- Engaging with many of the potential workshop participants beforehand to gauge their interest in the workshop and different topic areas.

Because the workshop centered on supporting engaging, inclusive discussions, Edwin Nelson of TerraLuna Collaborative, a cooperative consulting firm supporting systems-change initiatives, was hired as facilitator.

Furthermore, because the workshop was held remotely due to the COVID-19 pandemic, Google Jamboards, digital whiteboards where participants can post insights and ideas, were used to help facilitate group discussions.

This report contains an overview of each of the four session's discussion topics.

Session 1
Connection and Shared Language

Session 2
Divergence and Co-creation

Session 3
Co-creation and Convergence

Session 4
Convergence and Commitment

Session 1 Connection and Shared Language

Purpose: *Reflect on the past, present, and future in order to advance a shared vision for energy justice and equity in the Twin Cities.*

The session started with welcome messages from Jessica Hellmann, IonE Executive Director, and Makeda Zulu-Gillespie, UROC Executive Director, followed by an inspiring keynote address from Shalanda Baker, Deputy Director of Energy Justice for the Office of Economic Impact and Diversity, U.S. Department of Energy. Participants then engaged in two activities.

The first, a virtual "gallery walk," served as an icebreaker and provided an opportunity for knowledge sharing. This discussion activity tasked participants with reflecting and responding in small groups to key findings from the workshop's issue briefs [Appendix, page 20].

Next, participants completed a "collective visioning exercise" to imagine what the future of energy justice in the Twin Cities could look like and how to build it. For this exercise, participants rotated among small groups and responded to a discussion prompt. It was an opportunity to share their unique perspectives on energy justice with a broad and diverse set of peers. It was also an opportunity to reflect on historical contexts and information presented in the issue briefs and keynote presentation.

The three discussion prompts were:

Round 1: "What are the key principles of energy justice?"

Round 2: "If we achieved the goal of a more energy-just society, what would it look like?"

Round 3: "What steps do we need to take to ensure we reach our vision of a more energy-just society?"

Discussion Themes

In response to the final discussion prompt of the day ("What steps do we need to take to ensure we reach our vision of a more energy-just society?"), the following themes emerged:

- Addressing institutional racism.
- Reducing barriers (e.g., administrative, bureaucratic, capital, knowledge, organizing).
- Reckoning with and codifying our energy justice values and creating communities that represent those values.
- Ensuring accessibility and affordability of energy by changing existing financial models.
- Working to elect climate and energy justice champions for government positions.
- Restructuring energy decision-making at the Public Utilities Commission (PUC) and at utilities in order to promote the participation of new coalitions and partners.
- Recognizing intersections with economic, social, and environmental concerns.
- Prioritizing investments that benefit the most people (e.g., focus on electrifying public transportation vehicles, not single-owner all-electric vehicles (EVs)).

Session 2 Divergence and Co-creation

Purpose: *Taking inspiration from topics presented in Session 1, explore scenarios for an equitable energy transition. From these, identify project ideas that could be developed into pitch proposals and submitted for seed funding from IonE.*

First, volunteers presented scenarios for group discussion and served as discussion catalysts (moderators). Next, participants self-organized into groups based on their interest in a scenario. These groups then worked collaboratively on a PEST analysis for their chosen scenario, in which they identified the Political (P), Economic (E), Social (S), and Technological (T) factors that may enable or prevent it from occurring. This provided a comprehensive overview of the opportunities for and threats to collaborative action for each scenario.

Discussion Themes

Six workshop participants gave brief presentations on the following topics: increasing resources for community-based PUC intervenors; the non-energy benefits generated by a just, clean energy system; designing energy assistance programs for end users; solar energy's potential to fight poverty; energy as a human right; and the ability of energy policy to repair environmental harms. After the presentations, groups formed around the project ideas.

The following summary is of their findings:

Increasing resources for community-based PUC intervenors: The group determined that all intervenors need the same data, models, and software to be able to effectively comment on and impact utility plans. They also determined that there is a need to increase both community awareness of PUC activities *and* PUC awareness of community experience and expertise.

Non-energy benefits: The group discussed the many intersecting benefits of a just energy transition, including health (reduced pollution), economic (job creation), and climate change (reduced greenhouse gas emissions). They also considered how a wider coalition of activist groups, including those for sustainable housing, public health, workforce, education, and environmental justice, could deepen how we understand and communicate about challenges.

Energy assistance: The group pointed out the following needs: to coordinate assistance programs across agencies; to offer *opt-out* rather than *opt-in* programs; to provide navigators who can assist users in accessing programs; to secure more funding; and to remove language, information, and technological barriers to information and participation.

Discussion Themes (continued)

Solar energy: The group focused on the potential to increase workforce diversity and create jobs as the solar industry grows. It also identified Minnesota's Solar for Schools program as an opportunity to impact education through curriculum changes. [Note: The Solar for Schools Grant Program (Minn. Stat. 316C.375) is designed to stimulate the installation of solar energy systems on Minnesota public schools (K-12 and state colleges and universities) and integrate renewable energy use into the curriculum of those schools.]

Energy as a human right: The group discussed changing existing narratives and systems to focus instead on "energy self-determination" – or moving from a centralized fossil fuel economy to a decentralized, equitable, and just clean energy economy. They also highlighted the need to identify how energy intersects with housing and employment, thus resulting in overlapping damage to some demographic groups.

Environmental harms: The group focused on reckoning with white supremacy, the role of reparations, and implementing a state-level version of the Justice40 Initiative. [Note: The Justice40 Initiative is a 2021 Executive Order that aims to deliver 40 percent of the overall benefits of federal investments in climate and clean energy to disadvantaged communities.

Session 3 Co-creation and Convergence

Purpose: *Provide participants the opportunity to co-create a pitch presentation in support of a chosen project idea.*

Prior to this session, participants were encouraged to engage in a poll to identify the top 10 project ideas from Session 2. Projects needed to either leverage at least one opportunity or mitigate at least one threat.

Next, participants were encouraged to review the following elected project ideas and self-organize into groups based on interest:

- **Group 1:** 1) Identify and measure key non-energy benefits, particularly health benefits, of specific energy programs to develop metrics that can inform program implementation (e.g. energy efficiency programs); 2) identify the need for new methods/tools to measure health benefits.
- **Group 2:** 1) Design a study to quantify historic environmental harms to specific subpopulations caused by the energy system as well as the specific beneficiaries of historic energy-system investments; 2) translate the findings for different policy/regulatory contexts.
- **Group 3:** Conduct a survey of prospective energy projects in the Twin Cities that could align with guidelines – be made "shovel ready" – for federal climate investments through the Justice40 Initiative.
- **Group 4:** Support local artists and artists-in-training to develop media bridging the technical and human dimensions of the energy system.
- **Group 5:** Build a dynamic storytelling platform that collects and communicates the lived experience of energy insecurity in the Twin Cities in order to increase awareness of its impact.
- **Group 6:** Develop communication materials linking issues intersecting with energy justice, such as equitable housing and transportation, to empower community and housing groups to also advocate for a more equitable energy system.
- **Group 7:** Develop a model and implementation plan for an energy experience center that would empower customers to understand their energy bills, learn about the energy system, identify clean-energy skill training opportunities, and connect with employment opportunities.
- **Group 8:** Develop and pilot a program model for energy navigators, who would work directly with families to reduce energy insecurity. The navigators would provide holistic guidance by coordinating information and program opportunities offered by the government, energy assistance service providers, and utilities.

- **Group 9:** Develop and pilot an engagement model, inclusive of new staff roles and institutional structures, to facilitate community engagement in specific utility proceedings.
- **Group 10:** Support the development of curricula for K-12 students to understand and engage with solar projects deployed through the Solar for Schools program.

After participants self-organized into groups, they engaged in a facilitated exercise that helped them co-create the following elements of a pitch presentation:

- Problem Statement and Objective(s)
- Project Plan and Approach
- Desired Outcomes and Intended Impact
- Project Timeline and Budget
- Project Team and Leader(s)

At the end of the session, participants identified what steps were still needed to complete their pitch presentations.

Session 4 Convergence and Commitment

Purpose: *Support pitch presentations.*

After Session 3, the workshop planning team determined that groups would need additional time during and after Session 4 to work on their presentations. As such, Session 4 was dedicated to working on and presenting the pitches to the larger group for feedback.

The session started with participants returning to their groups to either complete their pitch presentations, including determining who would complete the budget template and by what date, or to review their progress and determine a timeline for completion. All pitch proposals were due by November 17, 2021.

At the end of Session 4, each team presented their pitch to the workshop for feedback. Some of the groups then continued working on their pitches until the deadline, while others submitted them at the end of session, with their proposed budgets due at a later date.

Discussion Themes

At the conclusion of Session 4, six groups presented on the following project proposals:

- ***Storytelling Platform:*** Build a dynamic storytelling platform that collects and communicates the lived experiences of energy insecurity in the Twin Cities in order to improve public understanding.
- ***Energy Equity and Housing Convenings:*** Work with housing and energy justice practitioners to co-develop two convenings that would build relationships and a common knowledge base; illustrate intersections between movements; and establish the foundation for coalition work that centers energy and housing as human rights.
- ***Energy Navigators:*** Conduct a landscape analysis to inform the design of a navigator pilot program and/or a funding plan for existing navigator efforts.
- ***Engaging in Utility Proceedings:*** Develop and pilot an engagement model to facilitate community members to become involved in Xcel Energy rate-case proceedings. The model would focus on educating consumers on the methods used to influence change at the PUC and utilities.
- ***Solar for Schools Programming:*** Empower youth across Minnesota, particularly in under-resourced communities, to advocate for Solar for Schools by developing a needs assessment, new materials, and convenings and trainings on solar topics.
- ***Energy Experience Center:*** Create a framework and prototype design for the Energy Experience Center. Elements to address include the physical space, educational partners, programming goals, and opportunities for community story-telling.

In addition, two groups initially self-organized around the following topics but later decided to disband and join other teams:

- ***Non-Energy Health Benefits:*** Synthesize and present information in an accessible way about the health benefits of energy programs in Minnesota; identify knowledge gaps regarding the intersection of energy and health; and identify policies that could improve health outcomes based on current information.

- ***Pilot Fund for Energy Debt:*** Create a fund for utility debt forgiveness.

Organizing an Equitable Workshop: What We Learned

This workshop series was designed to bring together a diverse cross-section of advocates representing varied lived experiences, sectors, and interests. It succeeded in bringing these perspectives together and producing a series of engaging discussions.

The workshop team also recognizes that working toward equity is a continuous learning process. Noted here are some things we learned from organizing this particular convening, which we are reflecting on as we continue this work.

- **Trust takes time to build.** It's incredibly difficult to build trust in a short period of time. That's because trust requires demonstrating consistent action, care, acknowledgement, and alignment with a goal over time. This is helpful to acknowledge when planning a workshop.

- **Likewise, new relationships form faster in person than online.** Many of the workshop participants hadn't worked together previously. Since they primarily interacted online, they also had few chances to engage each other in conversations that weren't anchored in a task or exercise, thus inhibiting the natural development of new relationships. We observed that project teams didn't form as quickly as we had anticipated.

- **Adding in-person events to virtual workshops can help.** Although the workshop was held remotely, an optional in-person lunch (held outdoors) offered participants a chance to meet in person. The informal lunch was well attended and fostered team-building discussions.

- **Competing priorities can prevent participation and collaboration.** This workshop series occurred during a period in time when members of the energy justice community were being asked to share their perspectives, experiences, expertise, and skills at multiple forums. For some, this limited their ability to participate in each of the sessions and as part of a project team.

- **It helps to set very clear expectations during the outreach phase.** The primary outcome of the workshop series was to foster the formation of project teams organized around one or more of the solutions for equitable clean energy co-designed during the workshop. But this outcome – and stated expectation that participants would form teams that would continue working on the projects following the workshop – wasn't made clear enough to everyone during the outreach and recruitment phase. This lack of clarity led to confusion when participants were asked to form project teams and further slowed down their ability to do so.

Proposals & Awards

With the aim of supporting impact-oriented work that increases energy equity and justice, the Energy and Equity in the Twin Cities Workshop offered participants the opportunity to secure IonE grant funding for solutions-focused projects. Teams developed proposals during the workshop to support particular goals and outcomes (e.g., building/strengthening networks, events, policy briefs, decision support tools, reports/publications, storytelling or art installations, classroom curriculum, workforce development activities, etc.) and to facilitate additional funding from other sources.

Funding for these projects falls within IonE's Impact Goals, an initiative that drives research and education toward specific barriers to achieving carbon neutrality in Minnesota. The grants also complement UMN's MNtersection priority of building a fully sustainable future. Workshop participants developed and submitted five proposals on December 10, 2021. Each was awarded funding and the news was announced to participants on January 22, 2022.

The projects are supported by a joint award for an Impact Goal Grant from the Energy and Equity in the Twin Cities Workshop, which was supported by the University of Minnesota's Institute on the Environment and the McKnight Foundation.

The following project summaries are based on information submitted by the project teams.

Workshop-funded proposals

Energy and Housing Justice Convenings

The project team aims to amplify connections between the movements for energy and housing justice, activate their most powerful intersections, and thereby support integrated efforts. They will do this by working with housing and energy justice practitioners to co-develop two convenings that will foster relationships, build a common knowledge base, illustrate intersections between movements, and build the foundation for coalition work. Because systemic change becomes more possible when energy and housing are framed and understood as human rights, the convenings will focus on centering them as such.

Team members: Michelle Wenderlich (independent scholar, community organizer), Julia Nerbonne (Minnesota Interfaith Power and Light), Leslie Moore (activist, organizer, research analyst), Annika Brindel (National Housing Trust), Ellie Leonardsmith (West Side Community Organization), Linda Kingery (formerly of Northwest Regional Sustainable Development Partnership), Mari Ojeda (Fresh Energy), Metric Giles (Community Stabilization Project).

Energy Experience Center at the Regional Apprenticeship Training Center (RATC)

Many inner-city residents and low-income neighborhoods lack awareness of how the energy system works and the role that it plays in their lives. They also typically lack access to career pathways and other opportunities emerging from the transition to a clean energy economy. Furthermore, existing programs targeted at delivering specific needs for an equitable transition to green energy transition aren't integrated into these communities.

In response, the project team will create a framework for a new Energy Experience Center, which will support year-round programming and opportunities among low-income and Black, Indigenous, and People of Color (BIPOC) residents for education, training, and community connection related to energy. The framework, which will be replicable and developed to support a prototype model at one or two locations, will address the physical space, educational partners, programming goals, and opportunities for community storytelling.

Team members: Jamez Staples (Renewable Energy Partners (REP)), Michael Krause (Kandiyo Consulting, REP), Joel Haskard (Clean Energy Resource Teams (CERTs)), Peter Lindstrom (CERTs), Kyle Samejima (Minneapolis Climate Action), Dr. Michael Wulf (Minnesota STEM Partnership).

Vital Energy Educational Gatherings

The project team aims to help community members acquire the wisdom to be able to know their position within the energy system. It will do this by educating them through an artistic lens and focusing on community relations. As part of the project, team members will organize a set of virtual educational gatherings centered on storytelling, during which national speakers will share about their relationships to energy. Energy navigators also will activate and inform community members on how to engage in energy and utility proceedings.

The project team will also arrange a set of research-based quantitative data that will uncover or map the impact of our energy systems on communities, create a publicly accessible drive with individuals stories related to energy usage and their relationship with energy systems, and display an innovative relationship between storytelling, artistic visuals, and energy systems by creating a booklet about the project.

Team members: Sebastian Rivera (artist, community organizer), Kyle Samejima (Minneapolis Climate Action), Tanessa Lewis (Fredrikson & Byron), Ben Werner (East Side Freedom Library), Nathan Twardock (Engineers Without Borders USA), Eastside Housing Justice Working Group, and a coalition of local community artists.

Energy Navigator Landscape Assessment

Research shows that with the right policies and practices, state and city governments and utility companies can eliminate many of the barriers preventing low-income households from accessing energy efficiency programs and services.

This project seeks to identify effective outreach methods and program approaches to support the development, integration, and piloting of a proactive "energy navigators" program that leverages the successes and best practices of existing programs while expanding efforts to reach more households and communities. To do so, the project team will conduct a landscape analysis that: inventories existing efforts consistent with the energy navigator approach; identifies current program gaps and barriers to implementation (e.g., outreach barriers); and articulates the expected (or perceived) impact of each navigator program's approach.

Team members: Elise Harrington (UMN Humphrey School), Carmen Carruthers (Citizens Utility Board Minnesota), Bill Grant (MinnCAP), John-Michael Cross (Environmental and Energy Study Institute), Lissa Pawlisch (Clean Energy Resource Teams), Nick Martin (Xcel Energy).

Solar for Schools Programming

This project aims to build on existing efforts to engage and develop student leaders in energy, build on existing efforts to collect and deploy solar curriculum in schools across Minnesota, and learn from examples of success. It will do this by supporting implementers of Minnesota's Solar for Schools (a state program for stimulating the installation of solar energy systems at public schools and the integration of renewable energy use into school curricula).

Specifically, the project team will offer support in meeting legislative requirements, building solar curricula plans, and realizing the installation of solar projects. It will do this by conducting a needs assessment for participants of Solar for Schools; coordinating and engaging student interns and research assistants in developing new teaching materials; working with college students to host convenings about the program at MIGIZI, a Minneapolis nonprofit nurturing the educational, social, economic and cultural development of American Indian youth; and training K-8/12 students in videography and solar energy so they can help develop videos targeted at their peers. In addition, the project team will package project materials in accessible formats and publish them on the Solar for Schools web page.

Team members: *Gabriel Chan (UMN Humphrey School), Michelle Gransee (Minnesota Dept. of Commerce), Joel Haskard (CERTs), Diana Dalbotten (UMN St. Anthony Falls Laboratory), Katie Pratt (Minnesota Environmental Quality Board), Kerry Wang (MIGIZI), Melissa Olson (MIGIZI), Bob Blake (Native Sun).*

Appendix

Issue Briefs

This series of briefs, created prior to the workshop series, is organized around an energy justice framework. Interconnected, but not exhaustive, the briefs are meant to provide background knowledge and shared terminology for workshop participants.

The briefs draw from community, academic, and professional sources, from archived and published information, and from background interviews. While attempting to be broad, we do not mean to be exclusive in our understanding of the energy transition with these briefs. Our intention is that they serve as a complement to peoples' lived experiences, knowledge, and contexts.

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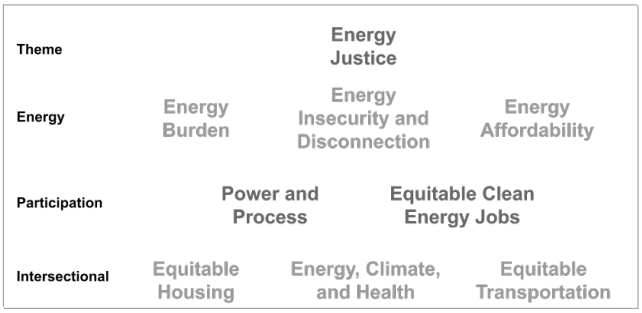
Overview of Energy and Equity in the Twin Cities

The energy system has never been equitable or just – but the transition to a new green energy economy gives us the opportunity to re-imagine not only how the costs and benefits of energy can be equitably distributed across society, but also the ways in which energy decisions can be made more justly.

We can build and transition to an equitable and just clean energy system. To do so, we both study the failings of the current system and partner with communities at the local level to build the new one. Along the way, we ensure that communities' knowledge and experiences are incorporated into decision-making, that their needs are met, and that benefits and opportunities are evenly distributed.

As organizers of the Energy and Equity in the Twin Cities workshop, we organized this series of briefs within an energy justice framework. Topic themes include Energy, Participation, and Intersectional issues (figure right). Interconnected, but not exhaustive, these briefs are meant to provide background knowledge and terminology for workshop participants.



The briefs draw from community, academic, and professional sources, from archived and published information, and from background interviews. While attempting to be broad, we do not mean to be exclusive in our understanding of the energy transition. It's our intention that this information is a complement to peoples' lived experiences, knowledge, and contexts – and we seek your feedback if we can improve how we represent this information. Likewise, the connections between the briefs are not completely drawn, leaving it to you, the workshop's participants and collaborators, to draw out action from those gaps.

To establish a broad base for communication, please review examples of different energy justice principles (below) and the glossary of terms (next page).

Principles of Energy Justice

Across the nation, frontline communities have come together to articulate their demands for a just energy transition:

- The White House Environmental Justice Advisory Council wrote that there must be a fair process to allocate 40% or more of the benefits of energy transition.
- The California Environmental Justice Alliance graded state legislators and legislation along the following eight environmental justice principles: 1) prioritize and value prevention, human health, and improved quality of life; 2) do no harm; 3) prioritize environmental justice communities; 4) conduct meaningful community engagement; 5) be proactive; 6) take an intersectional approach; 7) be responsive; and 8) respect community expertise.
- Energy Efficiency for All outlined a process for equitable electrification. Steps include: 1) assess the communities' needs; 2) establish community-led decision-making; 3) develop metrics and a plan for tracking; 4) ensure funding and program leveraging; and 5) improve outcomes.
- The National Association for the Advancement of Colored People (NAACP) created Equitable Solar Policy Principles, including but not limited to reflecting inclusive, community-driven theory of change; addressing past, current, and future impacts of climate change; and cross-cutting across different sectors when forming solutions, including workforce, food, and transportation.
- Delegates to the First National People of Color Environmental Leadership Summit (held in 1991 in Washington, DC) drafted and adopted 17 principles of Environmental Justice, including affirming the sacredness of Mother Earth; cessation of all pollution; the right to participate as equal partners in decision-making; and freedom from multinational corporations, military, and others who damage, repress, or exploit lands, peoples and cultures, and other life forms.

AN ENERGY JUSTICE GLOSSARY

Themes	Energy Democracy	The means of creating a decarbonized, inclusive, and equitable society, especially at the local level and in collaboration with communities.
	Energy Insecurity	The inability to meet basic household energy needs. It is characterized by economic hardship, lack of energy reliability, health harms, and behavioral strategies that help cope with the above insecurities.
	Energy Justice	The goal of achieving equity in both the social and economic participation of communities in the energy system. Contains dimensions of recognitional (who), procedural (how), distributional (what), and restorative (why) justice.
	Just Transition	A transition away from the fossil-fuel economy to a new clean energy economy that, according to Climate Just Alliance, provides "dignified, productive, and ecologically sustainable livelihoods; democratic governance; and ecological resilience."
Applied Terms	Energy-burden	The percent of a household's income spent on energy. The American Council for an Energy Efficient Economy considers an energy burden of 6% to be high and of 10% to be severe
	Frontline communities	Communities most affected by pollution and climate change.
	Low-income	Households and communities that earn below a certain percentage of average income. Definitions vary based on local factors.
	Under-resourced	Households and communities that have been systematically under-invested in and precluded from opportunities.
Programmatic Terms	Energy Rates	The per-unit rate that households pay for electricity and heating.
	Low-income Energy Assistance Program (LIHEAP)	Program providing energy assistance to low-income households throughout the nation. Currently, about 500,000 households in Minnesota (out of more than 2-million eligible) receive LIHEAP.
	Weatherization Assistance Program (WAP)	Program providing efficiency services to low-income households throughout the nation. It is often administered by the same agencies that administer LIHEAP.

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Energy Justice

Rooted in grassroots, community-driven movements, **energy justice seeks to establish equity across the energy system.** It has four core tenets: recognition *(who)*, procedural *(how)*, distributional *(what)*, and restorative *(why)* (figure left).

FIGURE 1: DIAGRAM OF THE 4 FOUR ENERGY JUSTICE TENETS

Recognition Justice (*who*)

Recognition justice focuses on identifying and advocating for communities that are ignored or misrepresented in energy decisions. In other words, it is concerned with *who* is recognized by decisions and in decision-making processes. This can include looking at how a program's design can impact who it serves. For instance, the community solar program available to Xcel Energy's customers, Solar*Rewards® Community, allows customers to receive some of their electricity from community solar gardens – yet it currently only targets higher-income customers. As of 2020, only 650 out of 20,000 participating households are verified as low-income.

Procedural Justice (*how*)

Procedural justice focuses on ensuring equitable decision-making processes across the energy system. It is concerned with *how* decisions are made. In 2020, the Office of the Legislative Auditor (OLA) reported that the Minnesota Public Utilities Commission (PUC), which regulates the state's electric, gas, and telecom utilities, failed to properly manage public proceedings and to educate on how to participate in them. This is damaging because without community input, well-paid experts who often have long-standing relationships with each other end up making decisions about resources. One example of procedural injustice cited in OLA's report is that PUC mismanaged crowd control and attendance protocols during hearings about the contested Line 3 oil pipeline.

Distributional Justice (*what*)

Distributional justice looks at the uneven allocation of costs and benefits on communities affected by the energy system. It asks, *what is going where*? An example of unjust distribution is how power plants often are sited in or near under-resourced communities, thus also placing the burden of their pollution on those communities. For instance, the Hennepin Energy Recovery Center, which burns garbage to create energy, is located near North Minneapolis.

Mapping tools can help examine the geographic distribution of the costs and benefits of the energy transition. The Minnesota Pollution Control Agency maps census tracts overlaid with air pollution scores. In addition, the Center for Earth, Energy, and Democracy made maps about environmental and energy justice in the Twin Cities, highlighting patterns of energy poverty amongst minority populations (Figure 2).

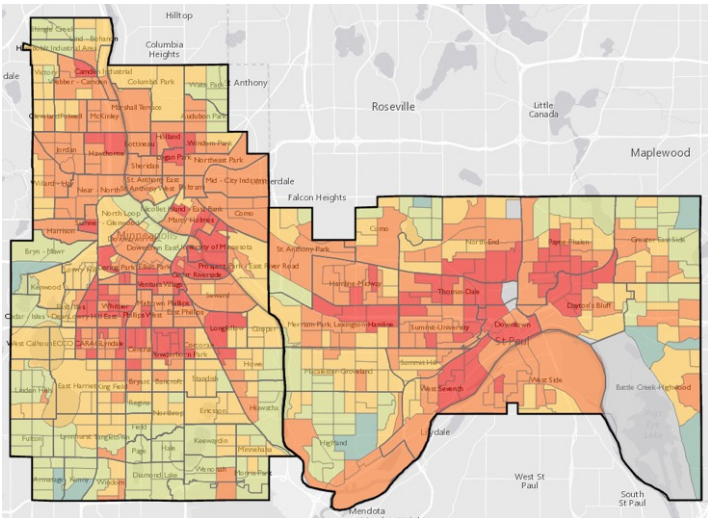

FIGURE 2: ENERGY VULNERABILITY IN THE TWIN CITIES

Energy vulnerability results from a lack of distributional justice for income, housing, and energy infrastructure. It often affects the neighborhoods with lowest incomes and highest BIPOC (Black, Indigenous, people of color) populations.
Image: Center for Earth, Energy, and Democracy.

Restorative Justice (*why*)

Restorative justice asks how best to respond to harm caused by the energy system and assists in pinpointing systemic changes that will prevent future harm. It asks, *why do things exist the way that they do?* In doing so, it seeks long-term solutions that address root causes.

Energy efficiency provided by the Weatherization Assistance Program (WAP) might be thought of as a form of restorative justice. Directing federal funds to low-income households, whose homes and apartments are often the product of decades of disinvestment, can bring some just economic relief for those who need it most (Figure 3).

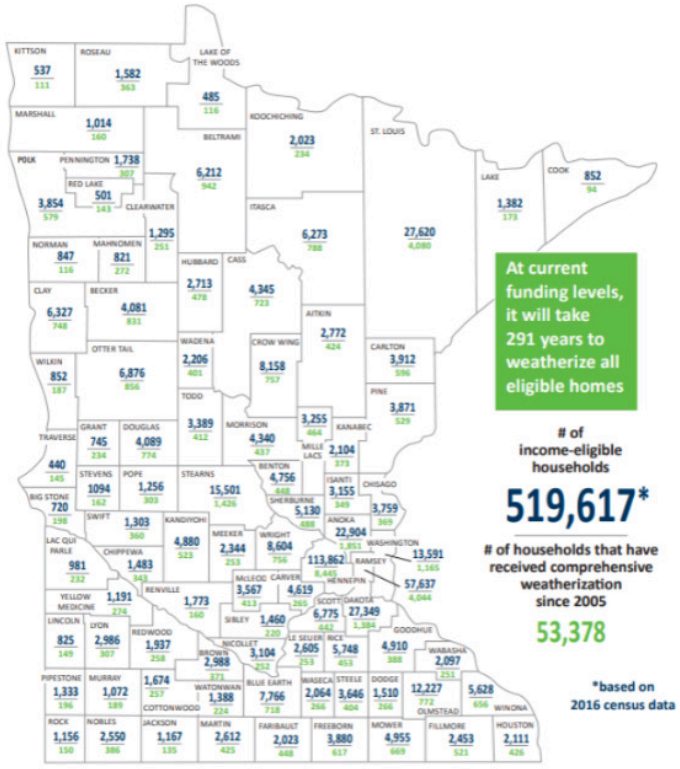

FIGURE 3: WEATHERIZED AND WEATHERIZATION-ELIGIBLE HOUSEHOLDS IN MINNESOTA

Weatherization is considered a form of restorative justice. At the current funding levels for the Weatherization Assistance Program (WAP), it will take 290 years to weatherize all eligible homes in Minnesota.

FURTHER READING & ADDITIONAL RESOURCES

Initiative for Energy Justice: The Energy Justice Workbook
https://iejusa.org/section-1-defining-energy-justice/

Heffron, R. J., & McCauley, D. (2017). The concept of energy justice across the disciplines. **Energy Policy, 105, 658-667.**

Minnesota Office of the Legislative Auditor:
Public Utilities Commission's Public Participation Processes

Minnesota Pollution Control Agency: Environmental Justice Map

Center for Earth, Energy, and Democracy: Map of Twin Cities Environmental Justice

Sahan Journal: Identifying environmental problems in Minneapolis green zones is pretty easy. Doing something about them is another matter.

Acknowledgements

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Energy Burden

Energy burden is the portion of a household's income spent on electricity and heating. An energy burden above 6% is considered high and an energy burden above 10% is considered severe. One might assume that a household's income level is the only factor that contributes to a high energy burden, but housing type and location, socioeconomic inequality, how energy policies are designed and dispersed, and customer behavior and energy knowledge are also important factors.

High energy burdens affect both physical and mental health. Often, they force households into difficult budgeting dilemmas. For example, households living in poverty can be driven into "heat or eat" situations when their monthly energy burdens become too high. Likewise, high energy burden may affect a household's ability to cover other essential costs such as transportation or even rent.

It's estimated by the American Council for an Energy Efficient Economy (ACEEE) that 25% (30.6 million) of all US households face a high energy burden. In the Twin Cities, the average household energy burden is 2%. But for households earning below 30% of the state median income, energy burdens increase to 10% in Minneapolis and 7% in Saint Paul on average (Figure 1).

To help households reduce their energy burdens, there are a variety of federally and customer-funded energy-assistance programs (see Energy Affordability brief) to help individuals across the Twin Cities.

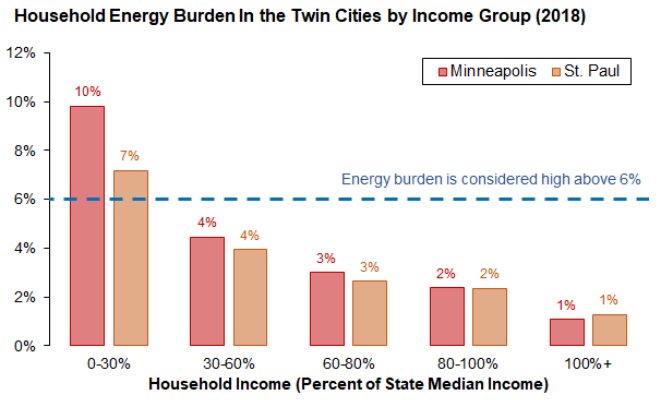

FIGURE 1: Average energy burdens are fairly equal in Minneapolis and Saint Paul except for the households with the lowest incomes, which have much higher energy burdens in Minneapolis.

WEATHERIZATION RECIPIENT JUAN BOLANOS (CENTER) STANDS WITH EMPLOYEES OF WEATHERIZATION PROVIDER SUSTAINABLE RESOURCES CENTER.

Facing a high energy burden with several home upgrades, Bolanos received funds from the state's energy assistance and weatherization programs to help pay his energy bills and install new insulation and a furnace, among other measures, at his South Minneapolis home. Picture and story from Minnesota Department of Commerce.

What Causes High Energy Burdens?

Energy burdens can be caused by several factors. The following list is adapted from ACEEE.

The **type and location of housing** can influence energy burdens in several ways. In Minnesota, energy burdens tend to be higher in rural areas that lack piped gas or electric heating. In urban areas, energy burdens tend to be higher for residents of older buildings, which may lack insulation and other assets that help lower energy bills. Energy burdens also tend to be higher in multifamily and public housing. This is partially due to the lower socioeconomic status among renters and to the inability of renters to control their energy bills. (Tenants of older buildings with gas heating, for example, often do not have control of the temperature of their unit. In such cases, the landlord has sole control of heating for the entire building.)

Energy burdens are also affected by **socioeconomic factors**. Households of color continue to face the enduring impacts of historic discrimination in home lending and labor markets. As a result, they often have lower incomes and less access to energy-efficiency retrofits, resulting in higher energy burdens. Likewise, households with immigrant, elderly, and disabled

residents can also face challenges to lowering their energy burdens due to economic hardship.

Energy policies can help, but those that fail to provide low-income households with truly equitable rates and/or sufficient funding to improve efficiency and invest in renewable energies can actually make energy burdens worse. When thinking about how policy affects energy burdens, it is also important to consider the practices of third-parties that sell or install energy-saving technology, including big-box stores and contractors. Currently, many lack equitable practices that expand access to their goods and services.

Behavioral factors that increase energy burdens can include a lack of knowledge about how to efficiently use appliances for heating and cooling, how to upgrade a home for energy efficiency, and how to engage with landlords or other professionals with control over a building's energy bills.

FURTHER READING & ADDITIONAL RESOURCES

American Council for an Energy Efficient Economy's Energy Burden Report

Sierra Club, Report: From Redlining to Restorative Justice
https://www.sierraclub.org/sierra/redlining-restorative-justice

Mapping Prejudice
https://mappingprejudice.umn.edu/

Tong, K., Ramaswami, A., Xu, C. K., Feiock, R., Schmitz, P., & Ohlsen, M. (2021). Measuring social equity in urban energy use and interventions using fine-scale data. Proceedings of the National Academy of Sciences, 118(24).
https://www.pnas.org/content/118/24/e2023554118

Brown, M. A., Soni, A., Lapsa, M. V., Southworth, K., & Cox, M. (2020). High energy burden and low-income energy affordability: conclusions from a literature review. Progress in Energy, 2(4).
https://iopscience.iop.org/article/10.1088/2516-1083/abb954/meta

Lewis, J., Hernández, D., & Geronimus, A. T. (2020). Energy efficiency as energy justice: addressing racial inequities through investments in people and places. Energy efficiency, 13(3), 419-432.
https://link.springer.com/article/10.1007/s12053-019-09820-z

What Energy Burden Gaps Are There in the Twin Cities?

There is a large racial gap between the energy burdens of Black and white households in the Twin Cities, especially for those earning below the state median income (Figure 2, above). This gap reflects the history of racist housing policy that systematically excluded Black and non-white families from homeownership and other means of wealth accumulation.*

*Lyubich, Eva. (2020). The Race Gap in Residential Energy Expenditures. Retrieved from https://haas.berkeley.edu/wp-content/uploads/WP306.pdf

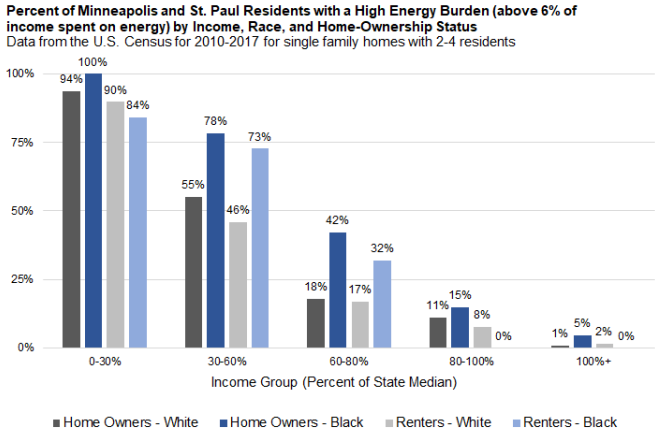

FIGURE 2: PERCENT OF MINNEAPOLIS AND ST. PAUL RESIDENTS WITH HIGH ENERGY BURDEN, SORTED BY INCOME GROUP, RACE, AND HOME-OWNERSHIP STATUS

At all but the lowest income levels, there is a substantial racial gap in energy burdens. While three-quarters of Black homeowners and renters in the Twin Cities earning 30 – 60% of the state median have a high energy burden, only half of white homeowners and renters of similar income levels do. This racial gap mirrors national trends: Black renters annually spend more than $270 on energy than comparable white renters; likewise, Black homeowners annually spend more than $400 on energy than comparable white homeowners. Data from the U.S. Census for 2010 – 2017.

Acknowledgements

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Energy Insecurity & Disconnection

When a household is unable to meet its energy needs, it experiences energy insecurity. According to a 2015 US Energy Information Administration report, one-third of US households experience energy insecurity.

When energy insecurity persists, a household's heat and electricity may be disconnected by the utility. Each year, tens of thousands of Minnesotan households have their energy disconnected due to energy insecurity.

Energy insecurity has three dimensions:

- ***Economic:*** *the financial burden that high energy costs impose on low-income households (also called energy burden)*
- ***Physical:*** *relates to housing and energy stock itself, such as expensive fuels and appliances that increase energy costs*
- ***Behavioral:*** *refers to coping strategies such as forgoing food, medicine, and/or other basic needs ("eat or heat" situations), pursuing high-interest payday loans, and reliance on dangerous alternative heating sources such as space heaters or ovens*

How Does Energy Disconnection Happen?

- First, a household begins to experience energy insecurity and misses payment on an energy bill. Often, this is the result of incurring additional essential expenses, such as medicine.
- The household is then considered in arrears (or "past-due") by the utility. Between 10% and 15% of utility customers are in arrears every month, but that number may increase during the winter (and for gas utilities in particular).
- When households are in arrears, the utility has the discretion to provide them with information about low-income rate discounts or energy-affordability programs such as the Low Income Home Energy Assistance Program (LIHEAP). Depending on how far into arrears a household is, the utility may also reach out to set up a payment plan. At any point while in arrears, a household can also contact the utility to negotiate a payment plan.
- If a household is in arrears for more than a month or if its debt to the utility increases beyond a certain threshold, the utility will begin to send it disconnection notices. The notices specify by which date the household must submit payment or sign up for a payment plan in order to avoid disconnection. The frequency with which disconnection notices are sent out varies by utility.
- Unless the debt is repaid to the utility or a payment plan is agreed upon, the household is disconnected and can incur an additional charge for that service. To get reconnected, the household may have to agree to pay higher interest rates, fees, penalties, deposits, and down payments.

From 2015 to 2019, regulated electric and gas utilities disconnected, on average, more than 50,000 residential customers a year. That amounts to disconnecting 0.5 – 5% of their residential customers annually, with some disconnecting more than 3% (chart below).

In 2020, disconnection rates dropped drastically thanks to legislation temporarily prohibiting disconnections during the COVID-19 pandemic.

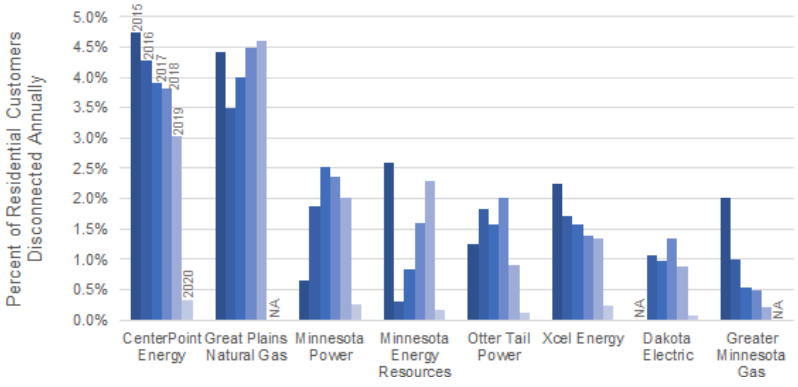

Figure 1: Some gas utilities (CenterPoint Energy, Great Plains Natural Gas) disconnect more than 3% of their residential customers annually; some gas and electric utilities (Xcel Energy) and/or electric-only utilities (Dakota Electric) disconnect about 1% of their customers annually.

Understanding the Experience of Energy Insecurity and Disconnection

In 2018, a team from the US Department of Energy worked with the Minnesota Public Utilities Commission (PUC) to examine disconnection practices in the state. As a part of the study, the team documented experiences of energy insecurity. The anecdotes they collected show the many ways energy insecurity affects the wellbeing of households as well as how challenging it is to overcome.

Here is one experience shared by a single mother living on disability in affordable housing:

- She brings in just over $1,000 a month, of which 30% goes toward rent. Because she lives with several medical conditions, including diabetes, depression, and asthma, she has had medical protection since 2014.
- She partakes in a rate-discount program offered by Xcel Energy to customers with medical conditions, which requires her to send in certification. Although she faxed Xcel Energy her certification in 2017, she learned in 2018 that it was never received, and so the utility threatened to shut-off her power.
- Her utility bills have been as high as $469 a month in the winter. She also incurred an additional $250 bill just on interest fees. To make matters worse, when she originally moved into her apartment in 2006, there was already a bill for more than $1,500 from the previous tenant that has remained on her account.
- Because her landlord has failed to make improvements to the building, leaking pipes have led black mold to spread in her home. The mold exacerbates her asthma.
- Living with energy insecurity affects her behavior. To cope, she turns down the heat in the winter even though she feels cold. She has the opposite problem In the summer: Her apartment gets very hot, which reaggravates her skin condition.

COVID-19 Consumer Protection Updates

The COVID-19 pandemic deepened the prevalence of energy insecurity among low-income households. Per the request of state officials in response to the pandemic, Minnesota's electric and gas utilities voluntarily suspended disconnections of both services in March 2020. (Outstate municipal and cooperative utilities either continued or have since resumed disconnecting customers.)

Last April, the PUC ruled that rate-regulated utilities can resume service disconnections of residential customers starting August 2, 2021. Customers who enter into a payment plan with the utility, or have pending or approved applications for LIHEAP, will not be disconnected or charged fees through April 30, 2022.

In addition to the current PUC protections above, three Minnesota statutes will continue to help protect consumers from energy disconnection going forward:

- **Cold Weather Rule:** From October 15 to April 15, utilities shall not disconnect residential customers and must reconnect them if reasonable payment plans are in place.
- **Extreme Heat Law:** If a heat advisory, excessive heat watch, or excessive heat warning is issued by the National Weather Service, utilities may not disconnect a residential customer.
- **Residential customer protections, including medical devices:** With proper certification, utilities shall offer payment plans to customers in arrearages and shall not disconnect customers using necessary medical devices.

FURTHER READING & ADDITIONAL RESOURCES

U Energy Information Administration: One in three U.S. households faces a challenge in meeting energy needs

Graff, M., & Carley, S. (2020). COVID-19 assistance needs to target energy insecurity. Nature Energy, 5(5), 352-354.

Verclas, K., and Hsieh, E. (2018.) From Utility Disconnection to Universal Access. US Department of Energy, Office of Policy.

Acknowledgements

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Energy Affordability

Energy-affordability programs (EAP) help defray energy costs for households across Minnesota. These programs often focus on reducing families' energy burden (the percentage of household income dedicated to electricity and heating costs) and improving the energy efficiency of homes. These programs and policies do this by providing monthly stipends for energy bills as well as payment assistance toward the maintenance, repair, and replacement of major appliances and systems that will improve a home's energy efficiency, including furnaces, insulation, and windows. In Minnesota, various energy affordability programs are offered by the government and by utility companies.

What Federal Affordability Programs Are There?

The **Low Income Home Energy Assistance Program (LIHEAP)** provides payment assistance to help low- and moderate-income (LMI) households afford their energy bills. To be eligible in Minnesota, households of a certain size must earn below 60 percent of state median income. (In 2021, a family of four must have a combined income below $65,000 to be eligible.) The program is federally funded yet is administered by the state.

LIHEAP provides an average annual benefit of more than $700 to each participant, helping to lower their total energy burden by three to four percent. More than 120,000 gas and electric customers participate in the program each year, which is only about a quarter of those who are eligible (~500,000 of 2.2 million total households). In the Twin Cities, the highest rates of EAP applications are concentrated in North Minneapolis and outside of Downtown Saint Paul (Figure 1).

Minnesota's **Weatherization Assistance Program (WAP)** was created in 1975. WAP annually serves between 1,000 and 2,000 households with home energy efficiency upgrades. Annually, the program assists about 0.3 percent or less of income-eligible households in Minnesota, at a cost of almost $15 million.

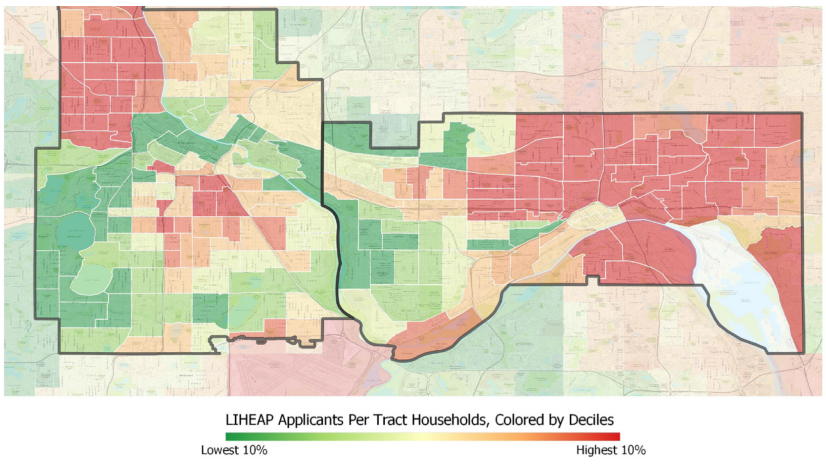
In the Twin Cities, the Community Action Partnerships of Hennepin County, Ramsey County, and Washington County administer LIHEAP and WAP to the majority of the eligible population.

What Utility Affordability Programs Are There?

In Minnesota, more than a quarter of the funding for low-income energy efficiency programs comes from natural gas and electric utilities. This is due to the state-mandated **Conservation Improvement Program (CIP)**, which specifies that gas and electric utilities must put a percentage of their annual revenue toward helping customers achieve a certain percentage of energy-cost savings. In 2021, legislation was passed that will more than double low-income CIP spending requirements for utilities like Xcel Energy and CenterPoint Energy going forward.

FIGURE 1: LIHEAP APPLICATIONS PER HOUSEHOLDS IN CENSUS TRACT, 2019.

The tracts with the highest rates of LIHEAP applications (shaded dark red) have more than one in nine households that apply for energy assistance. More than one in three households apply for energy assistance in the Jordan neighborhood in Minneapolis, and the Frogtown and Railroad Island neighborhoods in Saint Paul.



UTILITY	PROGRAM NAME	DESCRIPTION
Minnesota Power	Customer Affordability of Residential Electricity (CARE)	Customers can apply either for an automatic $15-per-month voucher toward their energy bills or a tailored Affordability Discount that keeps their energy burdens at three percent or lower.
Xcel Energy	Discount Program	All LIHEAP participants who are elderly or disabled and who receive service from Xcel Energy are automatically enrolled in this program. Every month, participants receive $15 toward their electricity bills.
	Gas Affordabilty	Alongside an arrearage forgiveness program, the Gas Affordability program (GAP) provides current or recent LIHEAP participants with benefits to keep their energy burdens at 4 percent. The utility recently applied to lower the burden target to three percent.
	Medical Affordability Program	Beginning in 2018, customers with certified medical circumstances who earn 50 percent of state median income (although 60% is allowed if funding persists) are given benefits to keep their energy burdens at 3 percent or lower. Arrearage forgiveness is also arranged if participants agree to a payment plan.
	PowerON	Created in 2005 in response to legislation, PowerON provides current or recent LIHEAP participants with benefits to keep their energy burdens at three percent or lower if they agree to a payment plan
CenterPoint Energy, Great Plains Natural Gas, Greater Minnesota Gas, Minnesota Energy Resources Corporation	Gas Affordability	GAP provides current or recent LIHEAP participants with benefits to keep their gas energy burdens between three and six percent, depending on the utility. Arrearage forgiveness programs are also offered.
Most, if not all, utilities	HeatShare	Through this program, customers can elect to donate money toward other customers' heating bills or repairs. Operated by the Salvation Army, HeatShare helps more than 4,000 customers annually.

Electric and gas utilities are also required to offer **low-income rate benefits** for residential energy bill payers. In the table above are examples of programs for LMI and other underserved customers. Currently, few if any municipal or cooperative utilities in Minnesota offer low-income rate programs.

Xcel Energy and Minnesota Power offer additional low-income renewable energy programs. Xcel Energy's **Solar*Rewards®** program provides upfront and ongoing incentives for income-qualified customers to invest in small-scale solar. Minnesota Power's **Low-income Solar Pilot Program** gives up to $55,000 each year to solar projects that benefit LIHEAP-qualified participants.

FURTHER READING & ADDITIONAL RESOURCES

Citizens Utility Board of Minnesota: Save Money and Energy
www.cubminnesota.org/consumer-resources/saving-money

Energy CENTS Coalition
www.energycents.org

Clean Energy Resource Teams: Under 5
www.cleanenergyresourceteams.org/under5

Acknowledgements

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Power and Process: A Case of the Public Utilities Commission

There are several levels of community participation that can be fostered in the energy system (Table 1). In a just energy system, community participation should be democratic and empowered.

TABLE 1: A SPECTRUM OF COMMUNITY PARTICIPATION IN THE ENERGY SYSTEM. ADAPTED FROM FACILITATING POWER, 2019.

Community Relationship	IGNORE	INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWERMENT
Community Engagement Goals	Deny access to decision-making processes	Provide the community with relevant information	Gather input from the community	Ensure community needs and assets are integrated into process and inform planning	Ensure community capacity to play a leadership role in implementation of decisions	Foster democratic participation and equity through community-driven decision-making. Bridge community and governance divide.

The Minnesota Public Utilities Commission (PUC), which regulates the state's electric, gas, and telecom utilities, embodies different levels of participation in the local energy system. In order to better understand each level, let's look at examples of how the PUC engages them.

Ignore: *When Participation Requires Money and Education, Many Are Left Out*

In contested cases at the PUC, where utilities ask to raise their electricity rates or site pipelines, citizens and organizations can act as "intervenors." Their testimonies must be considered by PUC commissioners. Intervenors also have the right to submit oral arguments, call witnesses, and engage in settlement agreements with state utilities. In non-contested cases, citizens or organizations can become "parties." Although parties lack the full rights of formal intervenors, they can request information from other parties and, at times, engage in settlement negotiations.

Despite these opportunities for community participation, it is difficult for people to become formal intervenors or form parties at the PUC due to a lack of information and training. Participation can also require a long-term commitment that can be costly. Currently, only lawyers who are well-informed on energy policy and regulation are equipped to participate.

Inform: *The Roles of Consumer Advocates*

While members of public and public organizations must apply to formally intervene in cases, the PUC automatically allows the Department of Commerce (DOC) and the Office of Attorney General (OAG) to intervene as public-interest advocates. These offices work on behalf of all residential and small-business consumers. Though they do help inform the public of PUC decisions they contribute to by posting information on their websites and responding to complaints, their outreach is limited, leaving a large sector of the public uninformed.

How the Public Utilities Commission (PUC) Works

Acting much like a court, the PUC's five commissioners decide on cases related to energy justice, mitigating climate change, and promoting energy democracy. Ultimately, they make decisions on power plants, investment plans, and pipelines, among other subjects.

There is a range of ways to participate in PUC proceedings: public processes and hearings on contested and non-contested cases, public comments, and open forums. Contested cases, overseen by judges as well as PUC commissioners, involve a slew of formal procedures. Non-contested cases, which are overseen by PUC commissioners alone, are more open to commissioner discretion.

Consult: *How Does the PUC Consult the Public?*

When deciding on specific cases and rules, the PUC opens up public commenting periods. As a matter of their docket proceedings, the PUC and utilities will often hold public meetings to gather comments. Meetings are planned to maximize attendance, and have to contend with providing proper notice, full information, and adequate facilitation. To further help the public-comment effort, an online portal is open for dockets accepting comments.

ENERGY DEMOCRACY

Energy democracy is the means of establishing a decarbonized, inclusive, and equitable society, especially at the community level. It does this by fusing social justice with climate and energy policy-making. As a movement, energy democracy promotes community involvement, collaboration, and empowerment in the energy system. It aims to redistribute power from private utilities to communities.

Such open access to public commenting is helpful but additional support is needed. In both online and in-person commenting, for example, citizens generally lack the legal rights and litigation skills of formal intervenors and parties, who often sway PUC members.

Involve: *Why Intervenor Compensation Matters*

Often, nonprofit consumer advocates like the Minnesota Citizens Utility Board or the Energy CENTS Coalition are allowed to intervene on behalf of the general public or specific low-income household interests. But as stated before, intervention or becoming a party can be expensive and require technical expertise.

Recently proposed state legislation seeks to improve compensation law. While the old law allows compensation for contested cases, the proposed new law also includes compensation for parties in uncontested cases. It also expands eligible organizations from nonprofits and citizens to Tribal Nations, thus further increasing access to a valuable means of participation.

Collaborate: *Environmental Justice Accountability Board*

The PUC follows a century-old method of regulating utilities. As it's modeled like a court, it shares the same blindspots to community participation as the judicial system. Luckily, there are people and organizations who have thought of ways to make collaboration more community-centered in PUC proceedings. Fresh Energy, with partners in the Energy Efficiency for All coalition, has proposed that Xcel Energy adhere to an Environmental Justice Accountability Board. Made up of community members, the board would develop solutions to advance equity through Xcel Energy's electricity and gas utility services. The proposal is novel and would be a first for Minnesota.

Empowerment: *An Aspiration*

Community empowerment in the energy system is an aspiration that can be achieved in many different ways. The PUC mostly regulates investor-owned utilities, for example, which means it only provides one pathway toward empowerment. And even outside of the PUC's jurisdiction, there are more than 120 municipal and cooperative utilities, which can be regulated by the communities that they serve. But cooperative solar developers and other community-engaged energy organizations highlight the potential for citizens and communities to inform PUC processes, collaborate in decision-making, and develop new ways to engage with the energy system.

FURTHER READING & ADDITIONAL RESOURCES

González, R. (2019). The Spectrum of Community Engagement to Ownership. Facilitating Power.

Minnesota Office of the Legislative Auditor: Public Utilities Commission's Public Participation Processes

Avelino, F. (2021). Theories of power and social change. Power contestations and their implications for research on social change and innovation. Journal of Political Power, 1-24.

Citizens Utility Board: CUB will expand public interest representation at the Public Utilities Commission

Comments of Fresh Energy and Energy Efficiency for All partners

Acknowledgements

Written by Matthew Grimley, Research Fellow, University of Minnesota, Twin Cities (UMN-TC). Research and contributions by Gabe Chan, Associate Professor, Humphrey School of Public Affairs (UMN-TC), and Heidi Ries, Policy Analyst, Energy Transitions, Institute on the Environment (IonE, UMN-TC). Edited by Megan Guerber, Managing Editor (IonE, UMN-TC). Designed by Sean Quinn.

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Equitable Clean Energy Jobs

Jobs are an important way of capturing some of the wealth generated by the transition to a clean energy economy. Therefore, a just energy transition requires supporting both current and new energy workers as well as under-resourced communities so that they are able to participate in and benefit from changes to the industry.

Because the energy transformation will be enormous, it will create many new jobs. For the US to reach 100% clean-energy production by 2035, for example, 500,000 additional solar workers will be needed. Significant job growth will also occur in other renewable energies such as wind, in specialities such as building efficiency, building controls, electric vehicles, and in adjacent careers such as research and administration.

Under-resourced communities, which traditionally have been overlooked by the energy system, need support to ensure that they have equal access to job opportunities created by the energy transition. According to a recent report by the Just Transition Listening Project, fossil-fuel workers displaced by the energy transition need access both to skill retraining and retirement pathways. In the long-run, communities reliant on the current energy system also need support attracting new types of businesses (and jobs) and with fostering self-reliance.

Clean Energy Jobs In Minnesota

In Minnesota, more than 50,000 clean energy jobs span different specialties, professions, and sectors (Figure 1). The bulk are currently in the energy-efficiency sector, with construction as the primary profession. Service jobs relating to administration and customers continue to grow. Like most sectors, clean-energy employment dropped by more than 10% in 2020 due to the COVID-19 pandemic. However, in late 2020, clean energy jobs rebounded twice as fast as any other profession, showing good signs for near-term growth.

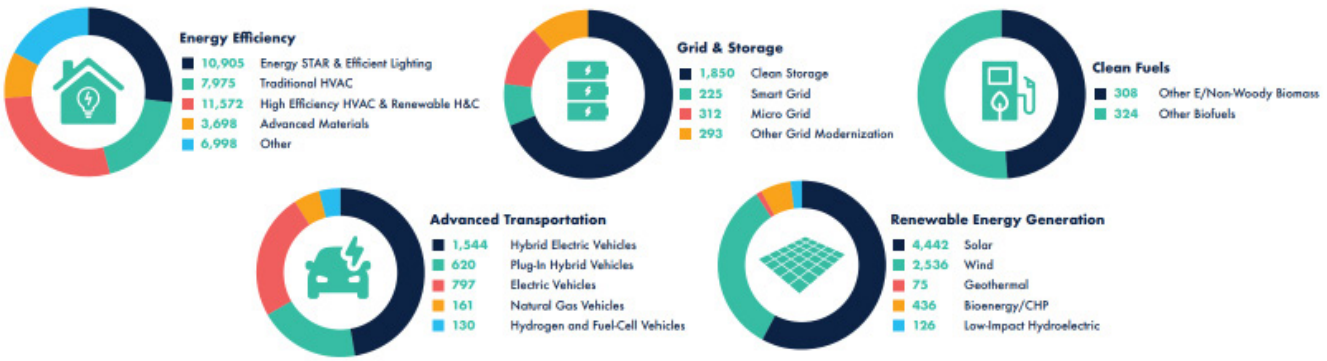
Job Training

State government and investor-owned utilities are initiating plans for the transition to green energy jobs. Last spring, Minnesota legislators introduced a bill to establish an Energy Transition Legacy Office to provide support for current power-plant employees and communities sited near power plants. In addition, a coalition of mostly investor-owned utilities based in the Twin Cities, including Xcel Energy and CenterPoint Energy, have started to re-imagine their contracting and workforce practices by participating in the state's Energy Utility Diversity Group.

In Minneapolis, Xcel Energy will be piloting energy-efficiency and solar skill-training programs for citizens living in designated areas of concentrated poverty or environmental injustice. Both job-training pilots are expected to launch next year.

In addition, North Minneapolis company Northgate Development, which runs Regional Apprenticeship Training Center (RATC), recently received a state grant for $2.5 million to create a clean energy careers program for students and young adults in underserved communities. The RATC will partner with the local chapter of Learn & Earn to Achieve Potential (LEAP)

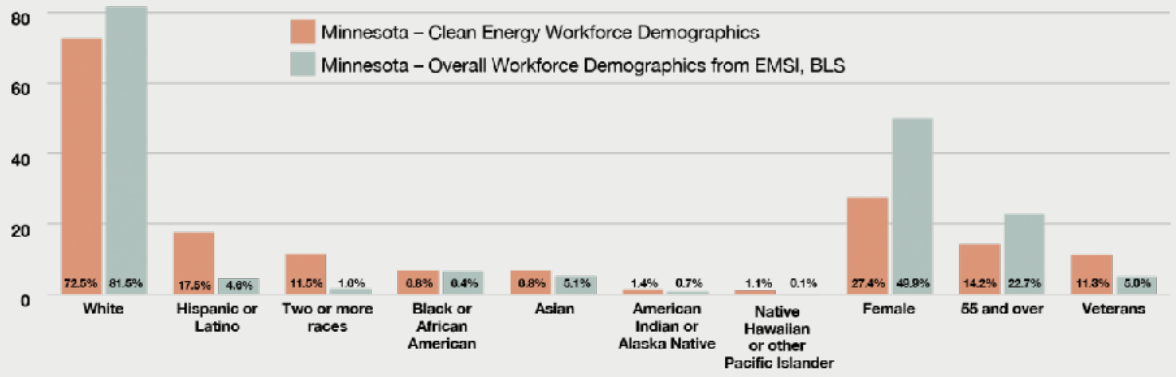
FIGURE 1: COMPARISON OF CLEAN ENERGY JOB TYPES ACROSS SECTORS IN MINNESOTA.



Minnesota Workforce Demographics

Nationally, the energy sector has below-average representation of women, Black, and Hispanic workers. Compared to Minnesota's overall workforce, the demographics are more balanced (Figure 2). Still, women represent only 27.4% of Minnesota's clean energy workforce.

FIGURE 2: COMPARISON OF DEMOGRAPHICS BETWEEN CLEAN ENERGY JOBS AND OVERALL WORKFORCE IN MINNESOTA. ADAPTED FROM CLEAN ENERGY JOBS MIDWEST.



initiative, a network of 12 alternative schools helping youth experiencing poverty, homelessness, and a lack of resources.

The city of Saint Paul, in turn, is currently building a clean energy workforce program in partnership with Ramsey County Workforce Solutions. This initiative will include a new apprenticeship readiness program that focuses on increasing the involvement of the city's BIPOC and women residents in clean energy trades.

Additional opportunities for clean-energy job training are offered by community colleges, nonprofits, and businesses in the Twin Cities (table below).

FURTHER READING & ADDITIONAL RESOURCES

Center for Energy and Environment: Minnesota's Power Plant Communities: An Uncertain Future

Energy Utility Diversity Group: Stakeholder Report

Clean Energy Jobs Midwest

Interstate Renewable Energy Council: Career Maps

Selected Green Jobs Resources

Just Transition Listening Project: Workers and Communities in Transition

TRAINING AREA FOCUS	LOCATIONS OFFERED
Energy Tech Specialist	Century College, St. Cloud Technical and Community College, others
Solar Certifications	Century College, Midwest Renewable Energy Association
Construction, Engineering, and Maintenance	Dakota County Community College, Hennepin Technical College
Energy Policy	Department of Science, Technology, and Environmental Policy at University of Minnesota

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Energy & Housing

Housing is Inaccessible or Too Costly for Many

To begin to understand the link between housing and energy in Minnesota, and the change required to make both systems more just, it's important to first look at the many disparities in housing in the state.

First, when it comes to home ownership in the Twin Cities, there is a substantial racial gap. Only 13% of homeowners are Black, Indigienous, and/or People of Color (BIPOC). Second, according to the Minnesota Housing Partnership, about 40% of Twin Cities' households (about 275,000) are renters, the highest number in the state. Many households (often in tracts with the lowest incomes and highest BIPOC populations) become cost burdened by rent or mortgage (Figure 1).

In all, more than 40% of renters in the Twin Cities (more than 120,000 households) are cost-burdened by their housing, meaning that they spend more than 30% of their income every month on rent.

According to the Minnesota Population Center, Twin Cities' households also face the most extreme housing shortage in the nation due to rising rents and the lack of pathways to building financial equity. Those earning the lowest incomes face a large continual housing shortage.

THE SPLIT-INCENTIVE PROBLEM

In rental housing, there's often a split-incentive problem that makes it tricky to inspire investment in energy efficiency and renewable energies. That's because it's common for some utilities (often natural gas in the Twin Cities) to be included in rent, effectively making it so that landlords share utility costs with their tenants. But when landlords pay for utilities, renters have less incentive to conserve energy. And when renters pay utilities, landlords have less incentive to invest in energy efficiency and clean-energy technologies for the building. This problematic dynamic makes it quite challenging for low-income households to make changes regarding the comfort, efficiency, and environmental impacts of their housing and energy usage.

Low-income Renters and Energy

In 2019, nearly 40% of energy-assistance program participants in Hennepin and Ramsey counties (more than 14,000 households) lived in subsidized housing or received a rent subsidy that could be put toward energy bills (figure below).

More than 30% of energy-assistance participants (nearly 13,000 households) had heat included in their rent. Less than 1% (only 84 households) had electricity included in their rent, likely because natural gas is the heat source for the majority of homes in the Twin Cities.

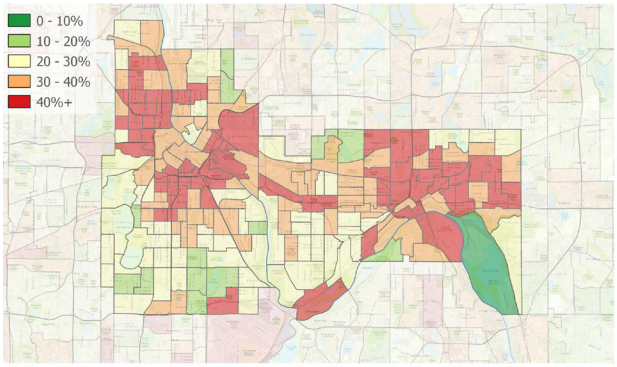


FIGURE 1: PERCENT OF HOUSEHOLDS BY CENSUS TRACT THAT ARE COST BURDENED BY HOUSING IN MINNEAPOLIS AND SAINT PAUL.

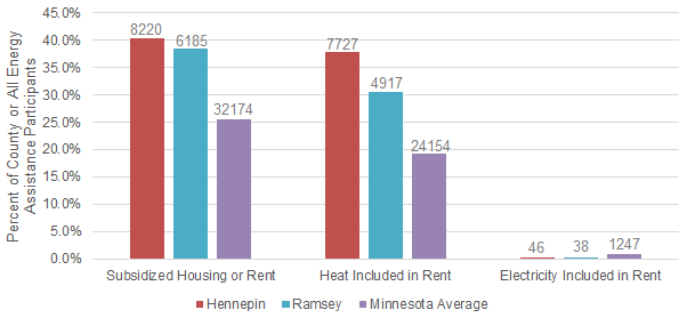
Data from Metropolitan Council, Equity Considerations for Place-Based Advocacy and Decisions in the Twin Cities Region.

Making Homes Healthier, More Efficient, and More Accessible

Low-income renters and homeowners generally live in housing that is older and, therefore, energy inefficient, resulting in high energy burdens. Technically, it is possible to reduce the energy burdens of renters by improving the overall energy efficiency of rental housing, but the work requires significant financial resources in order to encourage landlords to invest in it [see The Split-incentive Problem, left]. In the meantime, low-income households often are crushed by the competing costs of energy and housing, forcing them to either cope by making difficult tradeoffs [see Energy Burden brief] or seek a payment assistance program [see Energy Affordability brief].

FIGURE 2: PERCENTAGE (AND TOTAL ABOVE EACH COLUMN) OF COUNTY OR TOTAL MINNESOTAN ENERGY ASSISTANCE PARTICIPANTS WITH SUBSIDIZED HOUSING, HEAT INCLUDED IN RENT, OR ELECTRICITY INCLUDED IN RENT, AS OF 2019.

Among income-qualified households (50% of state median income) in Minnesota's energy assistance program, Hennepin and Ramsey Counties have some of the highest percentages of households with subsidized housing or heat included in their rent. In contrast, these Counties have among the lowest percentage of households whose electricity is included in their rents.



EVICTIONS

According to Princeton University's Eviction Lab, the eviction rates for the last decade in Hennepin and Ramsey counties were 0.74% and 0.58%, respectively. That translates into the eviction of nearly 2,000 Twin Cities' households a year.

The COVID-19 pandemic has temporarily disrupted eviction rates. Since March 2020, Minnesota has had an eviction moratorium in place to protect those who lost work from also losing their homes. Since then, the Minnesota Legislature has passed an "off-ramp" policy, effective this summer, that phases out the moratorium. Following the policy, all eviction restrictions will be lifted by June 1, 2022. (Refer to the Additional Resources section for more information.)

Minnesota also received $518 million in federal funding to provide emergency rent relief. Through the RentHelpMN COVID-19 Emergency Rental Assistance program, up to 18 months of back rent and utilities can be covered for approved applicants.

Housing and energy are deeply intertwined, but because the two fields often are disconnected, the ability to make efficient, impactful change can be thwarted. Housing policies create and maintain opportunities for low-income families to live in affordable homes, for example, but they can overlook energy expenditures in their calculations of housing-cost burdens. And while some programs do account for the link between housing and energy, including the federal Weatherization Assistance Program (WAP) and Minnesota's Conservation Improvement Program (CIP), the majority of their funding goes toward items that save energy but don't necessarily contribute to the health or comfort of households. Recent updates to CIP, allowing utilities to contribute more heavily to pre-weatherization measures, will allow the programs to reach more vulnerable households in the Twin Cities. Still, low funding limits how many households it can serve.

FURTHER READING & ADDITIONAL RESOURCES

Minnesota Housing: Sustainability and Energy Efficiency

Minnesota Housing Partnership: State of the State's Housing

Minnesota Multifamily Affordable Housing Energy Network (MMAHEN)

MMAHEN Presentation with Fresh Energy and Minnesota Housing

Hernández, D., & Bird, S. (2010). Energy burden and the need for integrated low-income housing and energy policy. Poverty & public policy, 2(4), 5-25. Retrieved from

Eviction Lab

Energy News Network: Updated Minnesota conservation program aims to close 'pre-weatherization' gap

Star Tribune: No wonder it's hard to find a new home: The Twin Cities has the worst housing shortage in the nation

HOME Line: Eviction Moratorium Phaseout Info and FAQ

RentHelpMN

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Energy, Climate, and Public Health

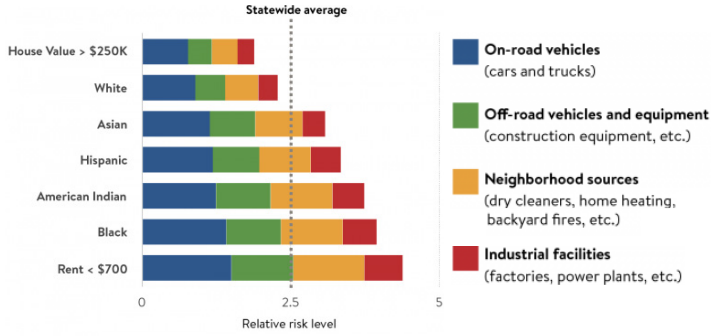
The increased frequency of extreme weather and pollution exposure have disproportionate public-health impacts on low-income households and communities of color. These impacts are exacerbated by the fact that the communities hardest hit by them often lack the resources to adapt to the increase in flooding, heat waves, droughts, air pollution, and heat-related illnesses brought on by climate change.

FIGURE 1: UNDER-RESOURCED COMMUNITIES IN MINNESOTA MORE AT-RISK FOR AIR POLLUTION

Communities with higher percentages of lower-income people, people of color, and Indigenous peoples have higher levels of air pollution from all source types. Places with higher percentages of expensive homes and white people have lower potential air pollution across all source types. Chart reproduced from the Minnesota Pollution Control Agency.

Rising temperatures and corresponding climate-change impacts also exacerbate pre-existing conditions such as heart and lung diseases and lead to new illnesses, including heat exhaustion.

For the transition to green energy to be just, we must recognize and address how climate change disproportionately impacts the public-health of under-resourced communities.



Local Impacts

While climate change is making winters in the Twin Cities milder and wetter, summers here will generally become warmer and drier, punctuated by more intense rain storms and flooding. According to the Minnesota Pollution Control Agency (MPCA), average temperatures in the Twin Cities have already increased by 3.2 degrees Fahrenheit from 1951 to 2012, punctuated (again) by more intense periods of heat. In the future, the increase in the number of extremely hot days for cities like Minneapolis is expected to make average temperatures rise by another 2 degrees over the next 30 years.

While this average-temperature increase may seem small, its impacts are great – especially in areas that lack green spaces, called "heat islands." These spaces are mostly paved and unshaded, causing their temperatures to rise up to 9 degrees Fahrenheit higher than other parts of the metro region (Figure 2). Because heat islands correlate with historic redlining practices (see Sahan Journal article, linked below), they further intensify the effects of climate change on communities of color that have, among other discriminatory practices, been prevented from buying homes in the Twin Cities.

Air Pollution

An increased demand for electricity and heating and shifting transportation patterns are creating more air pollution. This pollution includes fine particles ($PM_{2.5}$), ozone (O_3), sulfur dioxide (SO_2), nitrogen oxide (NO), and volatile organic compounds (VOCs). While air pollution has improved over the past two decades, the Twin Cities typically has fewer good air-quality days than other metro regions in the state. With an increase in forest fires – and fine particles floating into the area – bad air-quality days are expected to become even more frequent.

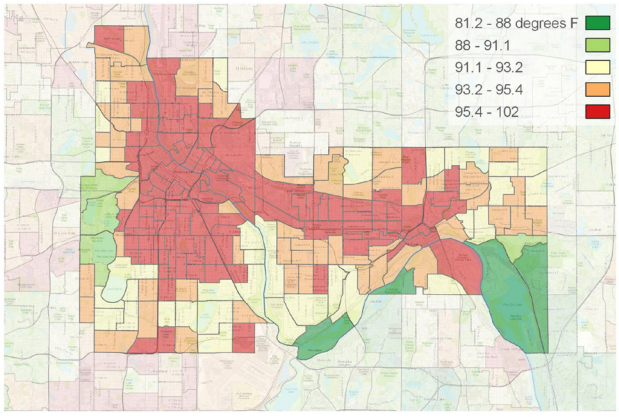


FIGURE 2: AVERAGE LAND SURFACE TEMPERATURE ON A HOT SUMMER DAY BY CENSUS TRACT.

Areas in red are regularly hotter than other metro areas and indicate the presence of heat islands. Data from Metropolitan Council, Equity Considerations for Place-Based Advocacy and Decisions in the Twin Cities Region.

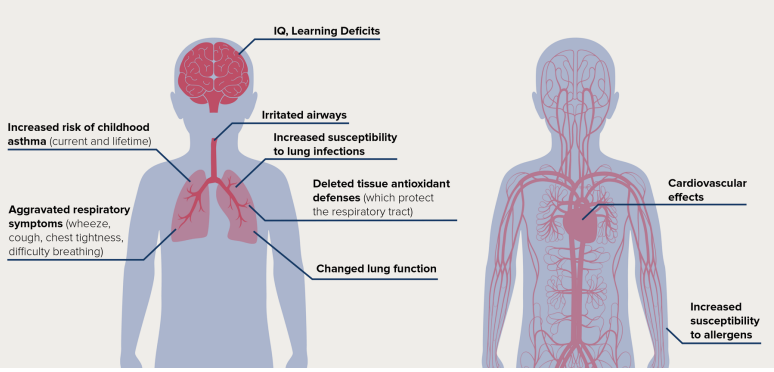


FIGURE 3: THE HEALTH EFFECTS OF NITROGEN DIOXIDE IN CHILDREN

One meta-analysis found that gas cooking contributed to a 32% increased risk of both current and lifetime asthma in children. Reproduced from Rocky Mountain Institute.

Each year, these pollutants cause thousands of deaths and hundreds of hospitalizations in the Twin Cities. According to the MPCA, zip codes with larger populations of impoverished residents, people of color, and Indigenous people experience higher rates of heart and lung conditions, and are therefore more vulnerable to air pollution. These populations also experience much higher levels of air pollution than others (Figure 1, previous page).

Indoor Air Pollution

Due to dust and allergens collecting in carpets and furniture and the presence of lead, asbestos, and other toxic chemicals in the building materials of older homes, indoor air quality can actually be worse than outdoor air quality. Furthermore, the energy sources we use in our homes can cause adverse health effects. Natural gas, for example, is used by the majority of Twin Cities' residents to cook and heat their homes. But using natural gas for cooking regularly exposes residents to unsafe levels of nitrogen dioxide, with especially harsh effects on children (Figure 3).

Indoor air pollution is further exacerbated by systemic inequalities. In areas vulnerable to increased flooding, under-maintained homes are much more likely to grow mold and provoke mold allergies among those living there. In extreme temperatures, older, inefficient homes without proper insulation will also be hit with more drafts of hot, humid, dry, and cold air throughout the seasons. Besides chronic stress, these uncomfortable living conditions can lead to long-term medical conditions such as asthma

FURTHER READING & ADDITIONAL RESOURCES

Minnesota Pollution Control Agency:
Effects of Climate Change in Minnesota

Minnesota Pollution Control Agency:
Life and Breath: How air pollution affects public health in the Twin Cities

Minnesota Department of Natural Resources:
Minnesota Climate Trends

U.S. Environmental Protection Agency:
Social Vulnerability Report

Sahan Journal: It's been a hot, dry summer in the Twin Cities, but not all neighborhoods are hit equally

Adamkiewicz, G., Zota, A. R., Fabian, M. P., Chahine, T., Julien, R., Spengler, J. D., & Levy, J. I. (2011). Moving environmental justice indoors: understanding structural influences on residential exposure patterns in low-income communities. American Journal of Public Health, 101(S1), S238-S245. Retrieved from https://ajph.aphapublications.org/doi/10.2105/AJPH.2011.300119

Rocky Mountain Institute:
Gas Stoves: Health and Air Quality Impacts and Solutions

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Equitable Transportation

Transportation is considered equitable when it is easy to use, affordable, environmentally sustainable, reliable, and energy efficient. For the **transportation system** to be considered equitable, underrepresented communities must be included in decision-making.

Historically, transportation has been an exclusive system that favors those already in power. For instance, society today relies heavily on a system of highways that privileges car ownership, fuel consumption, dispersed and segregated housing, and top-down decision-making.

Communities were shattered when Twin Cities Highways I-94, I-35, and 55 were built cutting through mostly Black neighborhoods, including Rondo in Saint Paul (pictured right). In recognition of this injustice, some organizations like the Minnesota Department of Transportation (MNDOT) have sought to make highway siting practices more inclusive.

CREDJAFAWN CO-OP STORE, RONDO NEIGHBORHOOD, APPROXIMATELY 1948.

By the 1930s, more than half of Saint Paul's Black community lived in Rondo. But in the 1950s, the community was shattered by the construction of Interstate 94. One in eight Black households in Saint Paul lost a home to I-94. Image courtesy of Minnesota Historical Society.

Affording Transportation

Transportation remains largely unaffordable for under-resourced communities in the Twin Cities. According to the Minnesota Department of Employment and Economic Development, transportation was the third highest household expense for households in Ramsey and Hennepin counties in 2020, costing a family of three an average of $775 and $786 per month, respectively.

According to MNDOT, mass transit, ridesharing, biking, and walking are often the most affordable modes of transportation. Yet mass-transportation costs can still be too high for low-income households, and walking and biking aren't always possible.

Local organizations are working to make transportation more accessible and cost-friendly for under-resourced communities. Although only 1% of those eligible actually use it, the Transit Assistance Program (TAP) from Metro Transit provides $1 fares to eligible low-income residents. NiceRide, which provides rentable bicycles, and Lime and Spin, which provide rentable scooters, also offer lower rental rates for those earning below a certain income.

Over the next two years, HourCar will begin deploying rentable electric vehicles throughout the Twin Cities, focusing first on areas with low car-ownership rates and high transit dependency. To help improve access to jobs, groups such as ISAIAH and Smart Investment in Transportation for Minnesota also aim to improve bussing and car access for low-income Minnesotans

Making Twin Cities neighborhoods more walkable and bikeable also could have several advantages, such as promoting increased physical activity and helping to reduce deaths by car accident. It also could support improved intersectionality between the housing, jobs, and transportation systems. One example of that is how the Metropolitan Council has sited affordable housing next to mass transit lines.

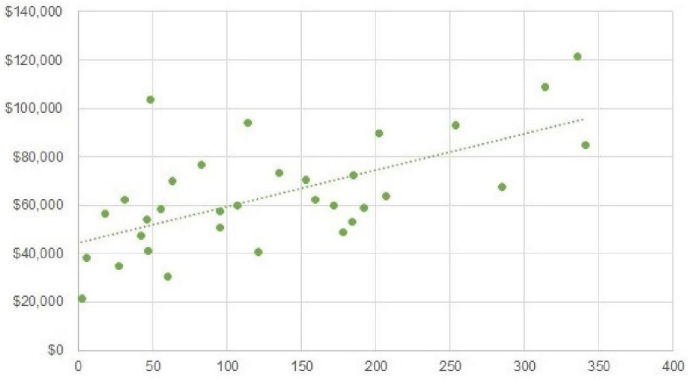
Electrification

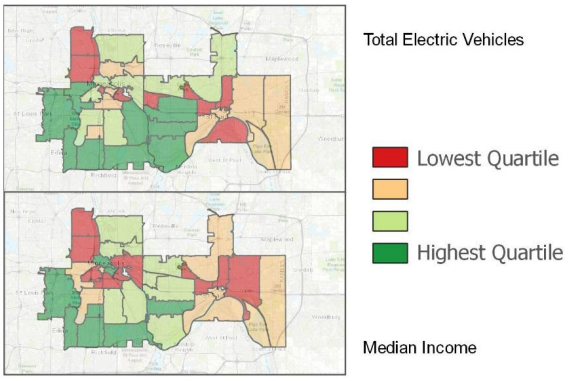
Transportation today burns fossil fuels and ethanol, emitting high levels of carbon and other pollutants. Research from the Minnesota Pollution Control Agency has demonstrated that communities of color and communities with lower socioeconomic status often experience more traffic pollution than wealthier, majority-white areas in the Twin Cities.

To eliminate this pollution, transportation must be electrified. At the state level, the Clean Cars Minnesota rulemaking will require vehicle manufacturers to deliver more lower-emission and electric vehicles to Minnesota by 2025. While the ruling will help reduce the number

FIGURE 1: MEDIAN INCOME BY COUNT OF ELECTRIC VEHICLES AMONG TWIN CITIES ZIP CODES (LEFT CHART) AND QUARTILES OF MEDIAN INCOME AND ELECTRIC VEHICLE COUNTS BY TWIN CITIES ZIP CODES (RIGHT, TWO MAPS).

As of February 2021, there are nearly 19,000 electric vehicles in Minnesota. More than one-fifth of those cars are located in Twin Cities zip codes, in mostly wealthier areas. Data from Public Utilities Commission and IPUMS NHGIS, University of Minnesota, www.nhgis.org.





of fossil-fueled vehicles in the state, it does not help to make high-priced electric vehicles more affordable or accessible. Today, the distribution of electric vehicles in the Twin Cities skews heavily toward higher-income areas (figure and maps above).

While the Metropolitan Council is planning to perform an equity analysis for deploying electric vehicles in the Twin Cities, local utilities like Xcel Energy are also deploying plans for charging infrastructure and pilot programs to bring more electric vehicles to the metro area. Xcel Energy also currently offers rebates for electric vehicles in the form of low charging rates.

Other organizations are focused more on electrifying mass-transit vehicles. As a pilot program, Metro Transit featured electric buses on their C-line in 2019, but due to technical issues with charging the buses, it had to cancel the investment. With a new $4.2 million-grant, the agency will purchase eight more electric buses.

Electric buses are also being prioritized for school children, who often suffer from the localized tailpipe emissions of conventional buses. The Minnesota Pollution Agency is deploying eight electric school buses (four to metro-area schools) in fall 2022. The Minneapolis Public Schools district is also exploring ways to bring electric school buses into their fleet.

FURTHER READING & ADDITIONAL RESOURCES

Metropolitan Council: Electric Vehicle Planning Study

Minnesota Department of Transportation: Advancing Transportation Equity Initiative

Minnesota Department of Transportation: Rethinking I-94

Sahan Journal: Electric vehicles have a reputation for appealing to 'fancy,' 'privileged' drivers. A new program seeks to boost access in diverse neighborhoods

Minnesota Reformer: Metro Transit has an excellent low income, reduced fare program, but people aren't using it

Minnesota Department of Employment and Economic Development: Cost of Living in Minnesota

Minnesota Public Utilities Commision: Electric Vehicles

Pratt, G. C., Vadali, M. L., Kvale, D. L., & Ellickson, K. M. (2015). Traffic, air pollution, minority and socio-economic status: addressing inequities in exposure and risk. International journal of environmental research and public health, 12(5), 5355-5372.

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ENERGY AND EQUITY IN THE TWIN CITIES WORKSHOP