Bridging the Gap:

Confronting the Disconnect Between Equity Commitments and Realities in Ontario's Energy Transition

by

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A thesis

presented to the University of Waterloo

in fulfillment of the

thesis requirement for the degree of

Master of Environmental Studies

in

Sustainability Management

Waterloo, Ontario, Canada, 2025

Author's Declaration

I hereby declare that I am the sole author of this thesis. This is a true copy of the thesis, including any required final revisions, as accepted by my examiners. I understand that my thesis may be made electronically available to the public.

Abstract

Globally, energy demands are escalating. Yet, much of this global energy demand is still being met through fossil fuels, thereby contributing to climate change. To mitigate climate change and promote sustainable development, an energy transition to a low-carbon economy is necessary, characterized by electrification (replacing fossil fuels with electricity) and a shift toward sustainable electricity generation through renewable energy sources. However, there remain significant obstacles to such an energy transition, including uneven policy support, lower power generation capacity, inadequate infrastructure (including energy storage), conflicts over land use, high upfront costs, and low public awareness. Equity and inclusion must be central to Ontario's energy transition, ensuring that marginalized groups are not excluded in future energy planning.

This thesis explores the context around Ontario's energy transition, with particular focus on how energy justice is considered within decision-making processes. Despite Ontario's relatively low-carbon electricity system, marked by significant reliance on nuclear and hydroelectric power, challenges persist since the required transformation (increased generation capacity alongside environmental considerations) presents key innovation, engineering, financing, and socio-political challenges. The evolution of Ontario's electricity infrastructure has been shaped by systemic disparities, with Indigenous communities continuing to face challenges rooted in colonial energy governance, including, but not limited to, restricted access to reliable and affordable energy resources. In contemporary times, Ontario's energy transition has been marked by uneven development, contested priorities, and fluctuating commitment to renewable energy, raising urgent questions about governance, equity, and accountability. Drawing on expert insights from across the sector, this thesis examines Ontario's energy sector through an equity-informed lens, exploring how equity considerations are currently, and could be more effectively, integrated into energy

decision-making processes. Specifically, the study investigates how existing equity indicators are interpreted, where they fall short, and what more context-sensitive, justice-oriented metrics might look like. This study is crucial as it seeks to bridge the current knowledge gap by focusing on the social dimensions of energy systems, which have historically been overlooked in decision-making processes in favor of technical and economic considerations.

The significance of this research lies in its potential to inform policymakers and stakeholders, providing insights that could lead to more informed and contextually rich decision-making. By focusing on the often-neglected social aspects of energy systems, the research will contribute significantly to the field of energy justice, advocating for a transition that is not only sustainable but also equitable. The study advocates for a multivalent approach, one that integrates social, technical, environmental, economic, and governance dimensions, to operationalize energy justice in Ontario. Findings reveal that equity cannot be achieved through isolated interventions but requires rethinking energy governance from fragmented, short-term fixes to long-term, systemic transformation. This includes transparent and participatory decision-making, recognition of lived experience alongside technical expertise, equity-based pricing mechanisms, targeted investments in underserved communities, and intergenerational planning. These interconnected strategies offer expert-informed directions for building an energy transition that truly serves the public good.

Keywords: energy justice, renewable energy transition, Ontario's energy sector, equity in energy policy, inclusive energy futures, inclusive governance, multivalent approach

Acknowledgments

This thesis was shaped by many hands, hearts, and minds who walked beside me and supported me throughout the journey.

To my supervisors, Dr. Mathieu Feagan and Dr. Dan Murray, thank you for your steady guidance, your thoughtful critique, and, above all, your faith in this project. Your mentorship has influenced not only these pages but also the way I think and write.

To the experts, who carved time out of their busy schedules to share their knowledge and engage with my research, thank you for your generosity, curiosity, and care. Your insights gave this project depth and purpose.

To my family, though distance kept us apart, your support never wavered. You have stood by me in every doubt, every quiet triumph, every tired silence, and every small step forward. Thank you for holding space for my dreams, always.

To friends, peers, and those I was fortunate to meet along this journey, thank you for sitting with me in confusion, explaining without condescension, and for building a community I will forever cherish.

To my neighbors and my roommate, who became my refuge in a place that didn't feel like home until you made it so. Thank you for the laughter, the meals shared, and for steadying me whenever self-doubt threatened to pull me under.

And finally, to God, for grace in the fog, for strength in stillness, for clarity in confusion, and for keeping me anchored.

To all of you, this work carries traces of your presence. I am deeply, humbly grateful.

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List of Abbreviations

CRE – Community Renewable Energy

DER – Distributed Energy Resources

ECO – Environmental Commissioner of Ontario

EEF – Emergency Energy Fund

EJ – Energy Justice

ESA – Electrical Safety Authority

ETI – Energy Transition Initiative

EV – Electric Vehicle

FIT – Feed-in Tariff

FPIC – Free, Prior, and Informed Consent

GDP – Gross Domestic Product

GEGEA – Green Energy and Green Economy Act

GHG – Greenhouse Gas

GTA – Greater Toronto Area

HELP – Home Energy Loan Program

IESO – Independent Electricity System Operator

IMO – Independent Market Operator (now part of IESO)

IRENA – International Renewable Energy Agency

LDC – Local Distribution Company

LEAP – Low-Income Energy Assistance Program

LNG – Liquefied Natural Gas

MW – Megawatt

NEB – National Energy Board

NIMBY – Not In My Back Yard

OCEB - Ontario Clean Energy Benefit

OEB – Ontario Energy Board

OESP – Ontario Electricity Support Program

OPA – Ontario Power Authority

OPG – Ontario Power Generation

SHAIP – Social Housing Apartment Improvement Program

SHARP – Social Housing Apartment Retrofit Program

SHEEP – Social Housing Electricity Efficiency Program

UGEAP – Union Gas Energy Assistance Program

UN – United Nations

Chapter 1: Introduction

1.1 Background & Context

With 55% of the world's population living in cities and 80% of the global gross domestic product (GDP) generated there, cities are the economic engines of our planet and primary drivers of global energy demand (Basu & Bale, 2023; Hoang et al., 2021; IRENA, 2020). Although urbanization has increased economic activity, business opportunities, and innovation, it has also contributed to and accelerated global problems like resource scarcity, environmental damage, and global climate change (IRENA, 2020) since a majority of the rising energy demands are powered through the use of fossil fuels (Madlener & Sunak, 2011). Rising energy demands, a dependence on fossil fuels, and the resultant environmental impacts necessitate a change in how energy is generated and consumed.

This call for change has included a push towards electrification (where fossil fuels are replaced as energy sources with electricity), coupled with an increase in renewable energy sources, aligning with the UN's Sustainable Development Goal 7.2 to increase renewable energy in the world's energy mix by 2030. The transition to renewable energy sources and electrification is promoting a greener future for developing cities, reducing environmental impact, mitigating climate change, promoting sustainable development, and increasing energy resilience (Edenhofer et al., 2012; Hoang et al., 2021). Ontario's electricity system is cleaner and has a lower carbon profile compared to other North American areas, with nuclear and hydroelectricity providing about 80% of output (Rosenbloom & Meadowcroft, 2014; Winfield & Weiler, 2018). However, Ontario's energy landscape reflects the global challenge of meeting the expected increase in demand for electricity while maintaining sustainable and equitable energy systems amid urbanization and climate change.

With advancements in sustainable alternatives and the push towards electrification, the energy sector has already undergone major transformations. The province has supported the deployment of new renewable energy technologies, confronting certain engineering, financing, and socio-political challenges, but new renewables continue to play a small role in comparison to the ramp-up of natural gas, showcasing the need for additional investment (Das et al., 2022; Qudrat-Ullah, 2014). Amidst this transition, equity considerations can become sidelined in policy and decision-making processes. This is a trend underscored by the province's hard turn back to fossil fuels, evidenced by the Premier of Ontario's memorandum of agreement with Alberta to build oil pipelines, alongside efforts to weaken environmental regulations and limit community consultation (Casey, 2025).

Ontario's energy transition is occurring within a landscape of uneven development, historical exclusions, and entrenched socio-economic disparities (Alook et al., 2023; Karanasios & Parker, 2017; Klein, 2015). While the province is a recognized leader in low-carbon electricity generation, the benefits and burdens of energy infrastructure, cost, and access have not been equitably distributed, leading to significant shortcomings (Calvert et al., 2022; Tarhan, 2022; Whiteley et al., 2021; Whiteley & Dumbrille, 2021). Indigenous communities, low-income households, renters, and rural residents frequently face unique barriers to participation in decision-making processes, experience higher energy burdens, and are often excluded from ownership or governance of energy systems (Alook et al., 2023; Wyse et al., 2021). These disparities risk being reproduced, or even worsened, during the current transition to more sustainable systems if equity is not intentionally integrated into policy and planning.

Biswas et al. (2022) ponder whether transformative shifts in social, economic, and technological realms enhance or exacerbate injustices within societies and economies. But both

are possible. The main challenges in energy transition are not singularly social, technical, or political, but rather multidimensional, thus requiring a multivalent approach across domains. Employing multivalent approaches advances considerations of equity, whereas concentrating solely on one sphere tends to exacerbate injustices.

Multivalent approaches require an understanding of the broader energy system, and, currently, there is a knowledge gap regarding suitable energy justice metrics to guide energy-related decision-making. This gap reflects both historical and ongoing emphasis on the technical and economic facets of energy systems, with social dimensions frequently marginalized in policy and planning priorities. The emergence of energy justice has prompted a reorientation towards investigating these social dimensions in energy research. However, a notable gap remains in examining how energy justice is integrated within the technical and policy domains of energy transitions, limiting efforts to develop a holistic understanding of the concept. Increased advocacy in energy justice research is crucial for addressing disparities in access, distribution, and decision-making, ensuring an inclusive transformation of the energy sector (Biswas et al., 2022).

This study takes the position that addressing these longstanding and emerging disparities requires a multivalent approach, one that integrates environmental, technical, economic, governance, and social dimensions. Drawing on insights from energy experts, the research examines how these domains intersect in shaping and often limiting equity outcomes in Ontario's energy planning. Without such integration, efforts to advance electrification or decarbonization risk reinforcing existing inequalities or creating new ones. This argument builds on the study's analysis of expert perspectives in the context of energy planning and justice in Ontario.

1.2 Problem Statement, Research Objectives & Questions

Employing a qualitative approach and an equity-informed lens, the research aims to draw on expert insights and a review of policy and historical developments to examine how equity considerations are understood and addressed within Ontario's evolving energy landscape. It draws on the four dimensions of energy justice (procedural, distributive, recognition, and restorative) to guide the analysis. In addition to assessing existing equity criteria, the study identifies new indicators and their potential applications, as proposed by groups of experts from different sectors, to evaluate Ontario's energy policy and planning practices. The insights emerging from a qualitative assessment are essential for centering energy justice as a core dimension of energy transitions, revealing that without it, these transitions risk perpetuating inequities rather than dismantling them. This approach aims to deepen understanding of how Ontario's energy transition can create pathways toward more inclusive and just energy futures.

As Ontario navigates ongoing debates around electrification and renewable energy integration, it is essential to question not only 'what' changes are being made, but also 'how' they are being implemented and for 'whom'. While there have been moments of progress, such as investments in conservation programs or limited renewable integration, these have often been followed by periods of stagnation or regression. Recent political developments, including agreements that prioritize fossil fuel infrastructure and calls to roll back net-zero commitments, signal a broader retreat from both climate goals and equity, diversity, and inclusion initiatives. In this context, discussions of equity must resist assuming a linear or inevitable trajectory toward progress. Instead, addressing equity requires a critical rethinking of governance structures, project priorities, and the criteria by which success is measured, criteria that center community well-being and participatory legitimacy.

By critically examining these dynamics, this research seeks to fill a critical gap in Ontario's energy planning landscape. It will contribute to a growing body of work that calls for equity to be operationalized, not as a rhetorical goal but as a measurable and accountable component of energy system design and governance. In doing so, the study aims to provide both practical and conceptual tools for building a more inclusive, just, and democratic energy transition in Ontario.

This research examines equity considerations in Ontario's energy sector transformation, particularly in the context of sustainable and renewable energy sources. It seeks to understand how equity is currently addressed in energy policy and planning, and how it could be more effectively integrated to support an inclusive and just energy transition.

Overarching Research Question

How are equity considerations currently, and how could they be more efficiently integrated into energy decision-making processes in Ontario to support a more just and inclusive energy transition?

Research Objectives

- To understand how energy experts in Ontario view equity and assess its role in current energy sector planning and policymaking.
- To examine expert insights that critique existing equity indicators and highlight the need for more nuanced, context-specific measures to evaluate how different socio-economic groups are considered in energy decision-making processes.
- To examine current equity considerations in Ontario's energy policies and practices, using expert-informed critiques to identify gaps and opportunities for improvement.

By exploring these tensions emerging from the perspectives of policymakers, industry professionals, and activists, the research underscores that equity cannot be advanced through isolated measures but must be embedded in a broader rethinking of how technical, economic, and governance priorities interact. By working with the insights and critiques of diverse Ontario-based energy experts, the study advances a more nuanced understanding of the multi-dimensional aspects of energy transitions through an integrated justice lens.

1.3 Significance of the Study & Expected Contributions

This study aims to investigate the energy sector transformation in Ontario with a particular focus on its implications for equity. It argues that understanding and addressing equity gaps requires a multivalent approach, one that bridges the technical, economic, environmental, and social dimensions of energy planning. It explores how shifts toward electrification and decarbonization have often occurred in a non-linear and contradictory manner, as reflected in various energy-related policies and practices. Additionally, this study will examine how the identified equity criteria can be practically applied to aid policy and decision-making processes that will guide the transformation of the energy sector.

Beyond theoretical contributions, the study also generates concrete and actionable policy recommendations informed by empirical findings and expert insights. These recommendations target gaps in current practices and offer strategies to embed equity more systematically into Ontario's energy planning and governance. Suggestions include frameworks for inclusive stakeholder engagement, mechanisms to measure and monitor equity impacts, and tools to integrate equity metrics in energy project evaluations. These insights aim to assist policymakers in designing more inclusive, just, and sustainable energy transition strategies.

Finally, this research will contribute to the growing body of literature, which will be significant in bridging the gap in energy justice research. The outcome aims to inform policymakers and stakeholders about the equity implications of said transition, contributing to more informed and contextually rich decision-making in the dynamic energy sector. By highlighting gaps in existing equity criteria and surfacing more context-specific considerations, this research contributes to a broader effort to reframe what a just energy future entails, one that is not only technically feasible and economically sound but also socially just and community-centered.

1.4 Thesis Outline

This thesis is composed of five main chapters: the introduction, the literature review, the research methods, the results, the discussion, and the conclusion.

The literature review (Chapter 2) offers a comprehensive overview of existing research on issues of energy justice, Ontario's energy sector transformations, and energy justice issues that exist in Ontario. Additionally, Chapter 2 offers a thorough explanation of the key topics that place the research problem in context and highlight the significance of the study.

The research methods (Chapter 3) explain the proposed research approach, the research design, the sampling strategy, methods for data collection and analysis, strategies for data validity and reliability, as well as the researcher's role in the study. This chapter justifies the use of a qualitative methodology and details how the data will be interpreted using an equity-informed lens.

The results (Chapter 4) present the findings of the study, organized thematically. This chapter explores the extent to which equity is considered in energy decision-making processes, drawing on expert insights to reflect on procedural, distributive, recognition, and restorative dimensions of energy justice. It also examines existing energy justice indicators, as well as those proposed by

participants, and considers their relevance and application within Ontario's energy policy and planning landscape.

The discussion (Chapter 5) builds on these findings through critical interpretation, linking the data to the broader literature, policies, and theoretical frameworks introduced in earlier chapters. It examines how the identified equity gaps and participant-proposed indicators align with or diverge from existing energy justice frameworks and reflects on the implications of these insights for advancing a more inclusive and just approach to energy policy and planning in Ontario.

The conclusion (Chapter 6) provides a synthesis of the main research findings, reflects on the implications of the study for both scholarship and practice, and offers recommendations for policy reform and future research. This concluding chapter reflects on how the research findings respond to the study's central questions and objectives, while highlighting the significance of integrating equity as a foundational component in energy transitions.

Chapter 2: Literature Review

Understanding the relationship between energy transitions and equity implications in the context of Ontario, Canada, requires situating the province's policies and actual practices within the global shift towards low-carbon and renewable energy systems, while raising critical questions about the social dimensions of this shift. Concerns about energy justice require a multidimensional lens to evaluate how energy systems distribute benefits and burdens, who participates in decision-making, and whose values and experiences are recognized.

This literature review begins by outlining key gaps in existing research on equity in energy transitions, particularly the lack of actionable justice metrics and the limited integration of energy justice principles into technical and policy decision-making in Ontario. It then explores the broader literature on energy transitions and the emergence of energy justice as a multidimensional framework for evaluating how energy systems distribute benefits and burdens, who participates in decisions, and whose values and experiences are recognized. The focus narrows to Ontario's energy landscape, tracing institutional evolution, governance trends, and persistent disparities. Building on this, the review examines how marginalized communities experience energy transitions in Ontario and identifies specific policy shortcomings. It also investigates how social and institutional variables such as gender, age, occupation, and organizational role influence how stakeholders perceive and prioritize justice. Together, these strands reveal the need for refined, context-sensitive indicators and more participatory, equity-driven governance. By foregrounding these issues, the chapter provides a foundation for this study's expert-based inquiry into how justice can be more effectively embedded in Ontario's energy decision-making.

2.1 Research Rationale & Gaps in the Literature

The literature on energy justice has increasingly recognized the importance of integrating fairness and equity into energy systems, moving beyond traditional focuses on technical efficiency and economic viability. Pioneering works by Sovacool and Dworkin (2015) have laid a foundation for understanding how energy injustices disproportionately affect marginalized communities, emphasizing the need for equitable access and decision-making processes in energy services. Research in regions like Ontario, Canada, has highlighted the practical complexities involved in implementing these principles, ranging from fragmented governance structures, and shifting political agendas to infrastructural limitations, affordability challenges, and historically embedded disparities in access. These challenges are deeply interconnected, operating across multiple levels of decision-making and policy implementation, and often reinforcing one another in ways that make equity difficult to define, let alone achieve in practice.

In Ontario, Policy initiatives like The Green Energy and Green Economy Act (GEGEA) exemplify this disconnect. Despite its intentions to boost renewable energy, the GEGEA faced significant backlash due to health and environmental concerns, demonstrating the challenges of aligning policy with justice principles (Songsore & Buzzelli, 2016; Whiteley & Dumbrille, 2021). Further studies such as those by Tarhan (2022) and Hoicka et al. (2022) have delved into the dynamics within community renewable energy initiatives and demand-side innovations, revealing a gap between the theoretical benefits of decentralized energy systems and the actual inclusion of diverse community members. These findings underscore a persistent theme in the literature: while the frameworks and theoretical understanding of energy justice have evolved, significant barriers in practice remain, particularly in terms of procedural, distributive, recognition, and restorative justice.

Despite these advancements, a critical gap persists, including a lack of nuanced, operational tools that would help in the integration of energy justice metrics within the technical and policy-making realms of energy transitions. Historically, energy policy and development have prioritized economic, political, and technical considerations, often at the expense of social justice aspects. It is a pattern that continues to shape present-day decision-making in complex and uneven ways (Biswas et al., 2022). This oversight has resulted in a fragmented understanding of how energy systems can be designed and governed to achieve equitable outcomes. The importance of addressing this gap cannot be overstated. As the energy sector continues to transition towards more sustainable models, incorporating energy justice principles is vital to ensure that these transformations do not replicate existing inequalities or create new forms of exclusion or marginalization.

While scholars have emphasized the need to bridge the technical dimensions of energy systems with justice frameworks, there remains a lack of context-specific, actionable metrics to guide decision-making. Ontario's energy landscape reflects the global challenge of transitioning towards sustainable and equitable energy systems amid urbanization and climate change. While considerable progress has been made in renewable energy adoption, the literature reveals persistent gaps in addressing energy justice. The literature on energy justice underscores the imperative of integrating principles of fairness and equity into energy systems beyond conventional considerations of technical efficiency and economic viability. Addressing this research gap is paramount for several reasons.

Firstly, it would foster a more comprehensive understanding of how energy policies and technologies affect diverse communities, potentially leading to more inclusive and equitable energy practices. Secondly, the development and application of justice metrics could underpin

more robust and socially just policy frameworks, enhancing public acceptance and the long-term sustainability of energy projects. Finally, prioritizing this gap can steer the future energy landscape towards not only cleaner and more efficient outcomes but also greater social equity and environmental justice, aligning with broader societal goals. By prioritizing equity considerations, policymakers can foster inclusive transformations of the energy sector, ensuring that marginalized communities are not left behind in the transition to cleaner energy sources.

Moreover, a multivalent approach integrating environmental, governance, economic, technical, and social dimensions is imperative for effective policy reforms. By engaging affected communities and implementing targeted interventions, Ontario can progress towards a more just and sustainable energy future for all its residents. Bridging the existing gap in energy justice research by developing and applying comprehensive justice metrics within the technical and policy realms is not only a necessary advancement for the field but a crucial step towards a more equitable and sustainable energy future.

This study addresses this gap by examining how experts in Ontario's energy sector understand and evaluate existing equity indicators, and by highlighting key limitations in their ability to capture the lived realities of marginalized communities. Although it does not aim to produce a finalized set of tools, the research seeks to point toward the types of criteria and contextual considerations that could inform more reflective and inclusive planning processes. In doing so, it contributes to broader conversations about how energy transitions can be assessed not just for their efficiency or sustainability, but for their social and distributive impacts. Such metrics would serve as critical tools for policymakers, helping to balance efficiency, sustainability, and equity, and ensuring that the benefits of energy transitions are shared across all segments of society.

2.2 Energy Transitions & Justice Frameworks

The future of energy systems is a significant policy challenge for industrial countries, as they are among the largest human enterprises and form the core of contemporary industrial economies (Miller et al., 2013). Because of their effects on the environment, technological advancements, and social and economic activity, urban energy systems can be categorized as complex, metabolic, and thermodynamic systems (Keirstead & Shah, 2013). However, the energy systems are not infrastructures that sit independent of wider society. This is a critical point when considering the pathways for, and implications of, energy transitions. Transforming energy systems involves changes in energy technologies, prices, as well as the social and economic structures built around energy production and consumption (Razzaghi Asl, 2022).

Energy systems also include machines, pipes, mines, refineries, devices, financial networks, workforces, institutions for trading in energy, roads, regulatory commissions, land-use rules, city neighborhoods, companies, and social norms and values that ensure their proper functioning (Aguilar & Gibson, 2023). Energy transition is a complex process that involves not only fuel sources but also social, economic, and political transformations (Miller et al., 2013). Traditional energy transitions involve fuel sources like wood to coal, coal to oil, or oil to renewables. However, these transitions also involve changes in energy systems, infrastructure, city construction, and energy sources. Transitioning to new energy sources like solar power or electric vehicles is not just about picking the right fuel; it's about how we set up our energy systems, who pays for new infrastructure, how cities are built, and which energy sources we use (Aguilar & Gibson, 2023; Cuenca et al., 2023).

Using a systemic approach, Biswas et al. (2022) pose the question of whether transformative changes in the social, economic, and technological spheres result in more equitable

societies and economies or worsen existing injustices and inequalities. The Just Transition Alliance defines a ‘just transition’ as a principle, process, and practice that coexists in a healthy economy and clean environment (Biswas et al., 2022). It emphasizes fairness, compensation for losses, frontline workers, and marginalized communities in policy solutions. A major goal of a just transition to a new global energy future is designing and implementing carbon-neutral energy systems that help the worst-off communities determine their own energy futures, alleviate poverty, and grow capabilities by disentangling and ending the energy-poverty nexus (D. N. Scott & Smith, 2018).

Many might find it puzzling to connect the concepts of 'energy' and 'justice', wondering what ethics, morality, and philosophy have to do with coal, oil, or electricity transmission. However, upon closer examination, the moral implications of our energy decisions become apparent and difficult to ignore. Works such as *Seeing like a State* (Scott, 2020), *Rehearsals for Living* (Maynard & Simpson, 2022), and *Development Drowned and Reborn* (Woods, 2017) have all documented how historically energy projects have worked hand-in-hand with settler-colonial agendas, dispossessing Indigenous peoples of their lands and reshaping territories to fit capitalist and settler governance. Hurlbert & Datta (2022) highlight how Indigenous communities in Canada bear disproportionate impacts from pipeline spills, yet are routinely excluded from decision-making, further underscoring how energy transitions risk replicating these injustices if they fail to center Indigenous sovereignty and historical accountability. As we face threats like climate change, pollution, energy scarcity, and nuclear proliferation, ethical dilemmas arise with no simple solutions. Routine energy analyses often overlook these equity and morality concerns, highlighting the need for a broader perspective in contemporary energy planning and analysis.

2.2.1 What is Energy Justice?

As stated by Jenkins et al. (2016), energy is a new focus for justice scholars, as the global energy challenge is characterized by resource scarcity, population growth, and unpredictable social and environmental conditions. Energy justice is crucial for energy planners and consumers to make informed choices, but our moral systems are not well-equipped to handle the complexity of modern energy problems, particularly climate change (Sovacool & Dworkin, 2015). The topic of justice enters many aspects of energy conversion, distribution, marketing, and use. Reframing energy problems as ethical or moral problems can help energy producers and consumers become more aware, accountable, and responsible for their decisions.

Energy justice is defined as the equitable distribution of the benefits and burdens of energy services rooted in and building upon the principles established by environmental and climate justice movements, namely distributive justice, procedural justice, and recognition justice (Heffron et al., 2015; Heffron & McCauley, 2017). It is centered on the idea that all individuals have access to affordable, safe, and sustainable energy, and are meaningfully involved in decision-making processes that affect them, which is a key concept in the just energy transition (Sovacool & Dworkin, 2015). Figure 1 illustrates the exponential growth of energy justice literature since 2009, underscoring the concept's rising importance in academic and policy discourses globally (Ferrall-Wolf et al., 2023). However, energy justice is still at an embryonic stage (Biswas et al., 2022) which is why there is an emphasis on the need to integrate past injustices, such as compensatory claims and lessons, and future injustices, such as intergenerational concerns.

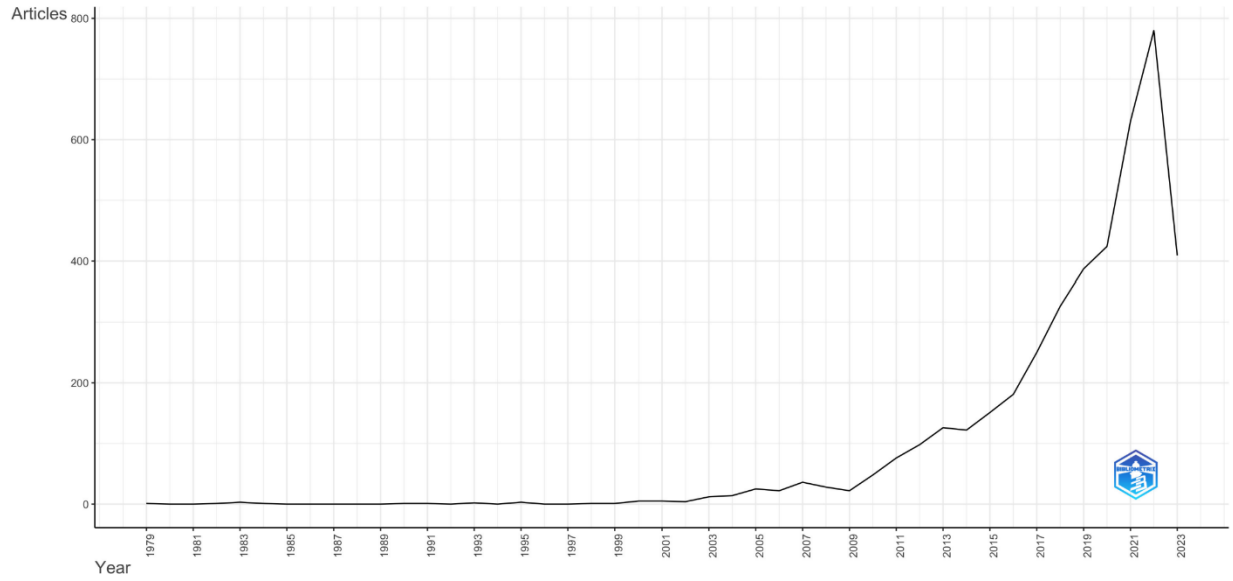


Figure 1: Increase in Energy Justice Literature (Ferrall-Wolf et al., 2023)

While climate justice and environmental justice include both energy and non-energy sources of (in)justice, energy justice is focused on energy systems. Non-energy impacts of projects, like the effects of new facilities on local biodiversity, can occasionally be captured by energy justice but on a smaller scale (Goldthau & Sovacool, 2012). Hernández (2015) goes on to say that the intersection of poverty and energy presents untapped and timely possibilities for seeking justice and equity, as both a social and environmental issue. In environmental and climate justice literature, 'sacrifice zones' refer to communities disproportionately burdened with the environmental, health, and economic costs of energy production and so-called 'development' (Abimbola et al., 2021).

Recent scholarship positions energy justice as a vital framework for advancing a just energy transition (Sun et al., 2023), a process that ensures access to sustainable energy while addressing the needs of workers, communities, and vulnerable populations affected by the shift away from fossil fuels (Bazilian et al., 2014; Wang & Lo, 2021). This includes recognizing energy poverty

as both a social and environmental issue, with implications for those historically marginalized in energy systems (Hernández, 2015).

Wang & Lo (2021) identify five key themes of a just energy transition. First, it is a labor-oriented concept, rooted in the labor movement's call for fairness in the shift away from fossil fuels. Second, it serves as a comprehensive justice framework that encompasses environmental, climate, and energy justice. Third, it is a sociotechnical transition, addressing both technological change and social equity. Fourth, it functions as a governance strategy, highlighting the importance of inclusive and just policymaking processes. Fifth, it involves public perception, focusing on how communities understand and experience the impacts of energy transition.

Energy justice offers an opportunity to explore injustices, recognize new societal sections, and develop new processes of avoidance and remediation (Jenkins et al., 2016). It can also be seen as a means to bridge existing and future research on energy production and consumption, aiming to achieve just energy-based processes and outcomes. Energy justice is pluralist, not restricted to a particular technology, application, location, or point in time (Biswas et al., 2022), and by drawing on intersecting justice traditions while offering a more manageable and domain-specific framework, it serves as a powerful means of analyzing and guiding equitable outcomes in energy policy, planning, and implementation.

2.2.2 Core Tenets and Indicators of Energy Justice

Energy justice is commonly understood through two main frameworks, each offering a distinct but complementary approach (Parovic & Kljajic, 2022; Wyse et al., 2021). It is first framed through three core principles, including distributive justice, procedural justice, and recognition justice, which apply across the entire energy system (Jenkins et al., 2016; Parovic & Kljajic, 2022;

Sovacool & Dworkin, 2015; Wyse et al., 2021). Additionally, energy justice is understood to encompass a broader set of principles, including accessibility, affordability, fair treatment, transparency and reliability, sustainability, intragenerational and intergenerational equity, and accountability (Parovic & Kljajic, 2022; Sovacool & Dworkin, 2015; Wyse et al., 2021). Figure 2 presents Heffron & McCauley's (2017) conceptual framework for energy justice, illustrating how core tenets, life-cycle stages, and applied principles interact to guide decision-making from theory to practice. At first glance, these two frameworks may appear to compete because one emphasizes three core justice tenets applied universally across the energy system, while the other expands the focus to a broader and more context-specific set of applied principles. However, they ultimately complement one another in advancing energy justice's broader goal of ensuring fair and equitable participation in the energy system while addressing the harms it has caused (Jenkins et al., 2020; Parovic & Kljajic, 2022).

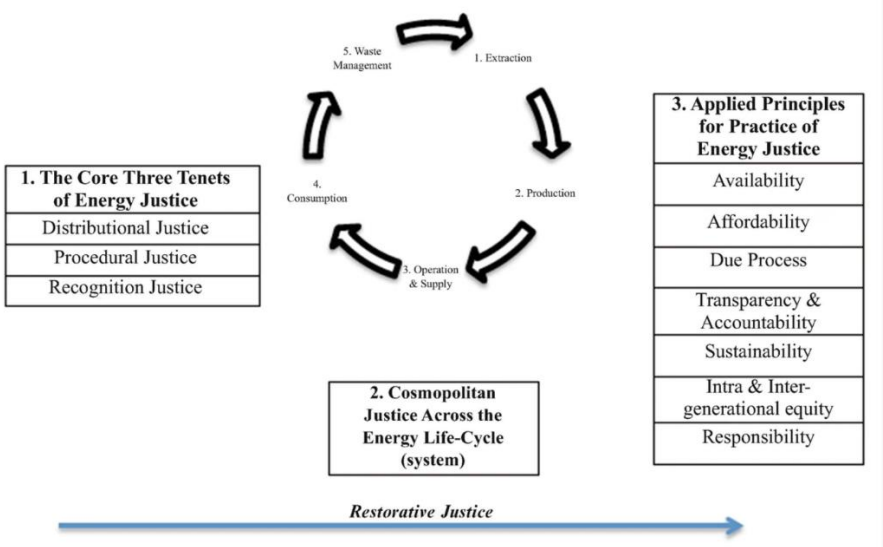


Figure 2: The Energy Justice Conceptual Framework (Heffron & McCauley, 2017)

The first framework centers on the "triumvirate" of core tenets used to identify and address injustices within energy systems (Astola et al., 2022; Heffron, 2024; Jenkins et al., 2016; Jenkins et al., 2020; Pellegrini-Masini et al., 2020; Sovacool & Dworkin, 2015; Wyse et al., 2021).

- Distributional justice refers to the fair allocation of benefits and burdens from energy systems, including access to resources, environmental harm exposure, cost distribution, and infrastructure siting. It addresses inequities in energy transitions by identifying and addressing the spatial and social distribution of gains and costs across populations.
- Recognition justice is the fair inclusion and representation of marginalized individuals and groups in energy systems, ensuring their dignity, rights, and specific needs are respected. It emphasizes the importance of recognizing social, cultural, and political identities, including Indigenous communities, ethnic minorities, the elderly, and people with disabilities.
- Procedural justice is the fairness and inclusivity of energy-related decision-making processes, ensuring equitable participation for all stakeholders, particularly marginalized groups. It involves transparent information sharing, local knowledge recognition, and institutional representation. It also concerns legal access, accountability, and governance integrity.

Jenkins et al. (2016) highlight the importance of the sequence of justice tenets, namely the 'what, who, and how.' While this may appear to suggest a linear process, it does not imply a hierarchy where recognition justice is subordinate to distributive justice or that the tenets operate in isolation. Jenkins et al., (2020) add procedural justice serves as a foundational condition for distributive justice. In other words, it is essential to first understand what is valued and by whom before one can meaningfully address the inequitable distribution of energy-related benefits and burdens (Wyse et al., 2021). In efforts to expand the framework's global applicability across the entire energy lifecycle and supply chain, a fourth tenet, restorative justice, was proposed.

Restorative justice in the energy context emphasizes the repair of harms caused by energy systems, whether these impacts are intentional, unintentional, or foreseeable (Heffron, 2024; Wyse et al., 2021). It calls for proactive measures to acknowledge, address, and remediate injustices. Rather than focusing on blame or punishment, restorative justice seeks to restore relationships, dignity, and well-being by ensuring that affected communities are meaningfully included in the processes of redress and recovery.

Other scholars have added an additional justice tenet, cosmopolitan justice. It is a principle that emphasizes the universal ethical responsibility to consider the impacts of energy decisions on all people, across national and regional boundaries (Heffron, 2024; Wyse et al., 2021). Rooted in the idea that we are global citizens, it calls for energy planners to account for cross-border externalities and the global consequences of energy production and consumption. This principle positions energy justice as a universal concern, asserting a shared ethical responsibility among all capable actors to understand and act on injustices across nations and contexts (Sovacool et al., 2020).

The second framework adopts a principled approach, intended for guiding energy policy and decision-making. It is built on eight core principles: availability, affordability, due process, good governance (transparency and accountability), sustainability, intra-generational equity, inter-generational equity, and responsibility (Parovic & Kljajic, 2022; Sovacool & Dworkin, 2015). The energy justice concepts, analytical applications, and eight decision-making principles are synthetic and intertwine many notions of justice. The identified energy justice indicators, derived from existing energy justice scholarship, include affordability, availability, information, and involvement (Sovacool & Dworkin, 2015; Wyse et al., 2021).

- Affordability: grounded in the energy justice principle of affordability, assesses whether energy services are financially accessible, particularly for low-income consumers. It emphasizes that energy costs should not impose a burden, highlighting the importance of stable, fair, and equitable pricing to all (Sovacool et al., 2016; Sovacool & Dworkin, 2015).
- Availability: rooted in the energy justice principle of availability, reflects the idea that everyone deserves access to adequate, high-quality energy resources. It emphasizes the importance of reliable supply, supported by technological innovations and investments that enhance conservation, transportation, storage, and distribution within the energy system (Sovacool et al., 2016; Sovacool & Dworkin, 2015).
- Information: derived from the energy justice principle of good governance, assesses whether individuals have access to clear, transparent, and relevant information about energy and environmental issues. This access is seen as essential for enabling informed participation and accountability within energy systems (Sovacool & Dworkin, 2015).
- Involvement: based on the energy justice principle of due process, evaluates whether communities are meaningfully included in decision-making processes for energy projects that impact them. It reflects the belief that those affected should have a voice and active role in shaping outcomes (Sovacool & Dworkin, 2015).

A promising avenue of future research is designing metrics or indicators that can better measure energy justice and incorporate its salience into energy modeling or quantitative research efforts (Wyse et al., 2021). Energy justice metrics could also be designed or differentiated around particular technologies, such as coal, natural gas, nuclear power, or wind energy. Energy transitions are a significant shift in human history, involving the reconstruction of complex socio-technological systems that connect energy with other systems like water, transportation, food

production, and housing (Miller et al., 2013). Understanding these transitions is crucial for policymakers, researchers, activists, and investors to navigate political opposition and unintended consequences, enhancing global human well-being through thriving, innovative, and sustainable communities (Jenkins et al., 2016; Sovacool & Dworkin, 2015; Sovacool et al., 2020).

2.3 Ontario's Energy Landscape and Policy Context

Answering the research question (how equity considerations are, and could be better, integrated into Ontario's energy transition) requires a grounded understanding of the province's energy landscape, including the historical and policy contexts that have shaped its current infrastructure and governance. While the literature can sometimes have a single-minded, technocratic view, often rooted in colonial frameworks of control and extraction (Simpson, 2017), it is important to recognize that there are, and have always been, multiple ways of relating to energy, land, and systems of care. Acknowledging these broader and more diverse perspectives including the past, present, and future is critical. However, for the purpose of this project, the focus is on examining Ontario's dominant energy governance structures and policies, and how they enable or constrain equity in transition processes.

This section begins by situating Ontario's energy system within broader urban energy dynamics and then traces its institutional evolution, equity challenges, and emerging governance gaps. As will become apparent, while Ontario has made significant strides in decarbonizing its grid and promoting clean energy, its transition remains shaped by centralized governance, uneven policy implementation, and structural exclusions that limit equitable outcomes.

2.3.1 The Urban Energy Challenge

Cities, occupying merely 2% of the Earth's surface, disproportionately account for 75% of its resource consumption and are central to economic activity, housing 55% of the global population and producing 80% of the world's GDP (IRENA, 2020; Madlener & Sunak, 2011). This intense urbanization not only fosters economic growth and opportunities but also intensifies global challenges such as resource depletion, environmental degradation, and climate change, fueled largely by the prevalent use of fossil fuels (IRENA, 2020; Madlener & Sunak, 2011). Cities are responsible for about two-thirds of the world's energy consumption and 70% of its energy-related CO_2 emissions, contributing significantly to climate change, which in turn exacerbates urban vulnerabilities to extreme weather events, air pollution, and associated health risks (Madlener & Sunak, 2011).

The anticipated urban population increase by 2.5 billion over the next three decades underscores the urgent need for sustainable energy solutions to mitigate these effects, aligning with UN Sustainable Development Goal 7.2 to increase the share of renewable energy by 2030 (IRENA, 2020). Although renewable energy adoption faces several challenges, including policy constraints, infrastructural and financial barriers, and public awareness issues, it remains a pivotal element of the transition towards low-carbon, resilient urban energy systems (Edenhofer et al., 2012). Advances in technology and sector coupling strategies are enhancing the integration and efficiency of renewables in urban settings, offering a path towards more sustainable and livable cities (Kammen & Sunter, 2016). The transformation of urban energy systems into models of resilience and sustainability could significantly impact global well-being and environmental justice (Kammen & Sunter, 2016). However, existing urban density and form present many challenges in

accommodating local actions to support energy transitions. Additionally, local conditions within each city and region influence how the energy transition takes place in unique ways.

2.3.2 Ontario's Energy Sector: Evolution, Institutions, and Governance

Canada's electricity governance is predominantly under provincial control, with provinces acting as separate Regional Transmission Organizations (RTOs) and the federal government having minimal influence over electricity policy (Winfield & Weiler, 2018). Ontario, Canada's most populous province, accounts for approximately 40% of the country's population and economy, making it a major actor in national energy policy. The province has maintained a mixed energy portfolio that includes nuclear, hydroelectric, natural gas, wind, and solar power, while also engaging in ongoing conservation efforts (Rosenbloom & Meadowcroft, 2014).

Historically, Ontario's electricity system was entirely hydroelectric until the mid-1950s, after which coal and nuclear generation were introduced to meet growing demand (Winfield & Weiler, 2018). Since the mid-1990s, Ontario's electricity system has undergone a significant institutional transformation from a vertically integrated monopoly, previously managed by the Crown-owned Ontario Hydro, into a complex hybrid market-based system. Triggered by the Energy Competition and Electricity Acts of 1998, Ontario Hydro was dismantled into several entities: Ontario Power Generation (OPG), Hydro One, and the Independent Market Operator (IMO), now the Independent Electricity System Operator (IESO), all of which remain provincially owned (Paehlke, 1997).

The Electricity Restructuring Act of 2004 introduced further reforms by establishing the Ontario Power Authority (OPA) to oversee long-term system planning and supply procurement, while expanding the Ontario Energy Board's (OEB) regulatory mandate. An Electrical Safety Authority (ESA) was also created to manage safety oversight functions (Albo & Evans, 2018).

The Ministry of Energy continues to serve as the principal policymaker, with legislative tools such as the 2004 Restructuring Act and the 2009 Green Energy and Green Economy Act (GEGEA) granting the Minister extensive authority to issue binding directives to core institutions like the OPA and OEB (Elston, 2012). Though the IESO has maintained a degree of operational autonomy, it remains subject to provincial policy direction. The 2014 provincial budget consolidated planning and operational responsibilities further through the merger of the IESO and OPA into a single entity (Winfield & Weiler, 2018).

Meanwhile, Ontario Power Generation (OPG) and Hydro One, although partially privatized, remain majority Crown-owned, continuing to manage the province's generation and transmission infrastructure, respectively (Hydro One Limited, 2021; Ontario Energy Board, n.d.-b). Local electricity delivery is handled by 60 municipal Local Distribution Companies (LDCs), which play an increasingly important role in distributed energy resources, conservation programs, and community-based energy planning (Winfield & Weiler, 2018). The Independent Electricity System Operator (IESO) oversees system operations, market administration, and long-term planning, under direction from the Ministry of Energy, Northern Development and Mines, and regulation by the OEB (Government of Ontario, 2021; IESO, 2024b; Ontario Energy Board, n.d.). The Ontario Energy Board remains a key regulator, with responsibilities that include rate-setting, project approvals, and overseeing capital investments in transmission, distribution, and Smart Grid infrastructure (Ontario Energy Board, n.d.).

Ontario's energy governance also features a growing role for non-governmental actors, including Indigenous communities, private generators, and large energy consumers, who increasingly shape energy outcomes through participation, advocacy, and regional planning processes (OPA/IESO, 2013; Thomson et al., 2021). The province coordinates electricity planning

at the local, regional, and provincial levels, aiming to engage communities, integrate design alternatives, and align multi-scalar energy priorities (Aguilar & Gibson, 2023).

2.3.3 Ontario's Energy Sector: Progress and Ongoing Challenges

The province's coal phase-out, completed in 2014, marked a significant environmental milestone and was driven by both air quality concerns and climate goals (Harris et al., 2015; Institut de l'énergie Trottier, 2024). This transition, paired with large-scale renewable and nuclear energy generation, allowed Ontario to maintain a low-carbon electricity profile while continuing to be a net electricity exporter since 2006 (Rosenbloom & Meadowcroft, 2014). The province has experienced several phases in electricity system evolution, notably the rapid deployment of smart meters and the introduction of the Green Energy and Green Economy Act in 2009, which significantly advanced the development of a smart grid and introduced a Feed-in-Tariff program to boost renewable energy, although its local content requirements were later ruled as violating World Trade Organization rules (Klein, 2015; Qudrat-Ullah, 2014; Whiteley & Dumbrille, 2021). Ontario emerged as a national leader in Smart Grid development, beginning with the mass deployment of smart meters between 2004 and 2010, however, policy formalization in these areas has lagged, leading to limited incorporation into long-term energy strategy (Winfield et al., 2010). See Table 1 for the major historical developments in Ontario's energy sector development to date.

Between 2005 and 2022, Ontario's population increased by roughly 22%, yet the province succeeded in reducing its emissions by 23% (MacDougall & Thorn, 2025), largely due to the complete phase-out of coal-fired electricity generation in 2014 (Harris et al., 2015). Today, approximately 87% of Ontario's electricity grid is emissions-free, and efforts are underway to expand clean energy capacity in anticipation of a projected 75% increase in electricity demand by 2050 (Government of Ontario, 2024). In 2024, the province expanded its largest-ever competitive

procurement for energy generation and storage from 5,000 MW to 7,500 MW, using a technology-driven approach to support this transition (Government of Ontario, 2024).

Readily available clean electricity has also played a role in attracting major investments, including Volkswagen Group's $7 billion EV battery plant and Honda's $15 billion EV supply chain initiative, both of which are expected to create thousands of jobs in the province (MacDougall & Thorn, 2025). Public uptake of clean energy technologies has been strong: since 2020, over 90,000 heat pumps have been installed across the province, and Ontario led the country in federal Greener Home Grant applications, with over 227,500 submissions between 2020 and 2024 (Natural Resources Canada, 2024). Additionally, electric vehicles (EVs) are gaining traction, comprising 7.7% of all new vehicle sales in Q3 of 2024, representing a nearly five-fold increase over four years (Statistics Canada, 2024).

Table 1: Timeline of Major Developments

Year	**Milestone**	**Description**
1906	Establishment of the Hydro-Electric Power Commission	Laid the foundation for Ontario's centralized public electricity system.
Mid-1950s	Expansion to coal and nuclear generation	Diversified electricity supply beyond hydro to meet post-war demand.
1998	Market restructuring and Ontario Hydro breakup	Created OPG, Hydro One, and IMO (now IESO); introduced market competition.
2004	Hybrid governance and smart meter rollout begin	Electricity Restructuring Act and launch of province-wide smart meter deployment.
2009	Green Energy and Green Economy Act (GEGEA)	Boosted renewables with the Feed-in-Tariff program and expanded Ministerial powers.
2014	Complete coal phase-out	Eliminated coal-fired power due to health and climate concerns.

2015	IESO and OPA merger	Consolidated planning and market operations into a single entity.
2022	Emissions-free grid, updated energy mix and Darlington Unit 1 refurbishment	53.7% nuclear, 25.9% hydro, 10.4% gas, 9.4% wind; 87% emissions-free grid [See Figure 3]. Darlington Unit 1 taken offline for refurbishment.
2024	Clean energy expansion, electrification trends, and major nuclear transitions	51% nuclear, 24% hydro, 16% gas, 9% wind [See Figure 4]; surge in EV sales (7.7%). Darlington Unit 1 reconnected to the grid ahead of schedule. Pickering Unit 4 permanently shut down and placed into safe storage.

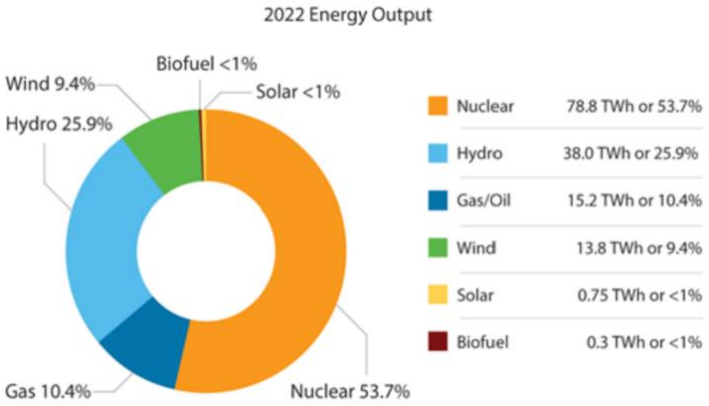
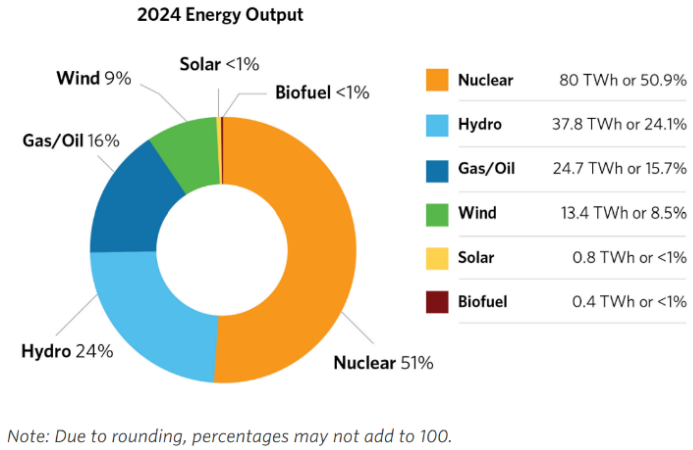


Figure 3: Ontario's Energy Mix 2022 (IESO, 2022)



Note: Due to rounding, percentages may not add to 100.

Figure 4: Ontario's Energy Mix 2024 (IESO, 2024a)

However, despite its decarbonized grid, Ontario has seen a gradual resurgence of natural gas use. As of 2024, the province's energy mix shifted significantly, where nuclear energy supplied 51% of Ontario's electricity, followed by hydropower (24%), natural gas (16%), and wind (9%) (IESO, 2024a)[See Figure 4]. This shows a significant change from 2022, where nuclear energy supplied 53.7% of Ontario's electricity, followed by hydropower (25.9%), natural gas (10.4%), and wind (9.4%) (Aguilar & Gibson, 2023; IESO, 2022)[See Figure 3]. The substantial increase in natural gas dependency reflects increased electricity demand amongst efforts to balance economic pressures and ensure grid reliability, particularly during peak demand periods (Winfield & Weiler, 2018; IESO, 2024b). This trend may also be intensified by the closure and refurbishment of Ontario's major nuclear reactors [See Table 1], which reduce available nuclear capacity and intensify reliance on natural gas to meet interim demand.

Although the share of nuclear has declined, it remains Ontario's primary energy source. While Ontario ensures universal access and grid reliability (IESO, 2024a; Ontario Energy Board, n.d.-b), longstanding issues with affordability, rising electricity prices, and heavy investment in cost-intensive nuclear refurbishments raise concerns about long-term sustainability and public trust (Financial Accountability Office of Ontario, 2020, 2022; Winfield & Weiler, 2018). Moreover, the needs and rights of Indigenous peoples and local communities remain insufficiently addressed in system design and consultation processes, undermining efforts toward democratic and participatory governance (Winfield et al., 2010). Ontario's energy planning and governance also remain hindered by shifting political priorities, limited alignment with national net-zero targets, and the removal of integrated planning frameworks needed to meet climate and socio-ecological goals (Harris et al., 2015; Winfield, 2020). The province's diverse regional needs also demand

more inclusive, localized planning approaches, but coordination remains limited (OPA/IESO, 2013; Thomson et al., 2021).

To address these challenges, Ontario must pursue more transparent, independent, and future-oriented governance, enhance public and Indigenous engagement, and embed flexibility and responsiveness into the energy system. This includes better alignment with climate targets, stronger support for emerging low-cost and low-carbon technologies, and institutional reforms that promote social equity, resilience, and long-term sustainability (Angheloiu & Tennant, 2020; Lazowski et al., 2018; Rakshit et al., 2019).

2.4 Understanding Energy Justice in Ontario's Energy Sector Transitions

2.4.1 Equity Considerations in Energy Policy

Equity in energy policy remains a critical yet underdeveloped dimension of Ontario's energy transition. Although Canada's overall electricity system provides universal access (IESO, 2024a; Ontario Energy Board, n.d.-b), this surface-level accessibility obscures deeper inequalities, particularly in affordability and energy burden (Financial Accountability Office of Ontario, 2020, 2022; Winfield & Weiler, 2018). Recent modeling shows that lower-income households, particularly the bottom 20% of earners, are disproportionately affected by rising electricity costs, with some provinces, including Ontario, projected to see this burden double by 2050. Meanwhile, higher-income households will spend a declining share of their income on electricity, further exacerbating inequalities (Canadian Climate Institute, n.d.).

In Ontario, efforts to address energy poverty and vulnerability have emerged inconsistently across various programs (Das et al., 2022). The term "energy poverty" itself is rarely used in provincial policy, appearing only in a handful of official documents (City of Toronto, 2019;

Environmental Commissioner of Ontario (ECO), 2018; Ontario Energy Board, 2015a). However, there exist multiple initiatives that aim to directly target energy-related issues through financial support, efficiency programs, and consumer protections (Das et al., 2022). Financial relief has been a dominant approach, exemplified by the Ontario Clean Energy Benefit (2011–2015) and the Fair Hydro Plan (2017–2018), both designed to offset the rising cost of electricity through bill rebates and inflation-based caps, though their fiscal transparency and long-term equity impacts remain (Office of the Auditor General of Ontario, 2017; Ontario Energy Board, 2015).

More targeted measures, such as the Ontario Electricity Support Program (OESP), have provided income-adjusted monthly bill credits for low-income households, including enhanced assistance for high-usage needs such as electric heating or medical equipment (Ontario Energy Board, 2015b). Emergency aid programs, such as the Low-Income Energy Assistance Program (LEAP) and the Union Gas Energy Assistance Program (UGEAP), offer one-time support to households at risk of disconnection (Ontario Energy Association, 2020; Ontario Energy Board, 2015b; Union Gas Limited, 2013). However, such measures are limited in duration and fail to address persistent structural vulnerabilities. Other programs, like the Ontario Energy and Property Tax Credit and the Emergency Energy Fund (EEF) in Toronto, provide partial relief but are often reactive in nature and tied to social assistance eligibility (Das et al., 2022; Ontario Energy Board, 2015a).

Consumer protection frameworks have evolved to include mechanisms such as disconnection bans, security deposit waivers, and budget billing options. These have reduced the immediate risk of energy-related exclusion, especially during winter months or crisis periods such as the COVID-19 pandemic (Hill & Mauracher, 2020; Office of the Premier of Ontario, 2020). However, such protections are more reactive than transformative (Das et al., 2022). Energy efficiency and retrofit

programs have shown promise in addressing longer-term structural challenges, especially in housing quality and energy consumption. Programs like the Home Energy Loan Program (HELP) (City of Toronto, 2017), Save on Energy Home Assistance, Union Gas Home Weatherization (Ontario Energy Board, 2016), and Enbridge's Smart Thermostat (Enbridge Gas Distribution Inc, 2016) initiative have supported both general and low-income households in making efficiency upgrades. Ontario's climate plan (2016–2020) included three notable, large-scale retrofit funding for social housing through Social Housing Apartment Improvement Program (SHAIP) (City of Toronto, 2018), the Social Housing Apartment Retrofit Program (SHARP) (City of Toronto, 2016), and the Social Housing Electricity Efficiency Program (SHEEP) (Government of Ontario, 2017), although political shifts, particularly the 2018 cancellation of the cap-and-trade program, prevented their continuity.

Despite these efforts, significant gaps persist, particularly for renters who face split incentives and lack control over housing infrastructure. Many energy policies rely on vague or inconsistent definitions of vulnerability, often failing to recognize its multifaceted nature, linked not just to income or consumption, but also to demographic, health, and geographic factors (Das et al., 2022). This limits the design of policies that could systematically address the root causes of energy poverty. A broader critique concerns the regressive structure of cost recovery in Ontario's energy system, where flat-rate service fees and borrowing from future ratepayers disproportionately impact those least able to pay (Das et al., 2022). Finally, Canada's positioning under SDG7, while suggesting broad access to energy, obscures the lived realities of hardship and compromise. Without a clear, context-specific definition of energy poverty and corresponding metrics, the province risks further entrenching inequities as electricity prices rise and system upgrades continue. Comprehensive, intersectional, and forward-looking equity strategies, anchored in

affordability, access, and meaningful inclusion, are necessary to ensure Ontario's energy transition does not deepen socio-economic divides.

Figure 5 and Table 2 together offer a comprehensive overview of Ontario's energy policy evolution and its equity implications. The timeline (Figure 5) traces critical milestones from early hydro developments and market liberalization to targeted affordability reforms like the Ontario Clean Energy Benefit and the Fair Hydro Plan, highlighting the province's attempts to balance market efficiency with consumer protection (Das et al., 2022). Table 2 complements this by thematically analyzing equity-related initiatives, identifying persistent structural gaps in affordability, access, and systemic design.

Table 2: Equity Considerations in Ontario Energy Policy

Equity Theme	Key Insights
Affordability & Financial Support	Lower-income households are disproportionately impacted by rising electricity costs, with their share of income spent on energy projected to double in some provinces including Ontario. Programs like the OCEB and Fair Hydro Plan provided bill rebates but faced criticism for lack of fiscal transparency and regressive cost structures.
Energy Efficiency & Housing	Efficiency programs like Save on Energy, SHAIP, SHARP, and SHEEP offered retrofits and energy savings, especially in social housing. However, political changes (e.g., cancellation of cap-and-trade) disrupted progress. Renters face split incentives and barriers to participation, as many programs target homeowners.
Emergency & Targeted Assistance	Programs like LEAP and UGEAP provide short-term relief to households facing utility disconnection, but do not address structural vulnerability. Monthly credits under OESP assist low-income consumers, with enhanced support for those with medical or heating-related electricity needs.
Consumer Protection	OEB rules include disconnection bans, arrears management, and budget billing. Protections were expanded during the COVID-19 pandemic. However, many safeguards are reactive rather than systemic.
Definitions & Policy Gaps	Energy poverty is rarely defined in Ontario policy. Lack of consistent definitions of vulnerability hinders targeted policymaking. Indicators such as the 10% energy burden threshold are used without justification for the Canadian context.

System Funding & Cost Distribution	Current cost-recovery models are regressive. Flat fees and borrowing from future ratepayers disproportionately impact low-income groups. Progressive taxation is proposed as a fairer funding alternative.
Future Directions	Despite progress under SDG7, affordability challenges and system inequities persist. New federal policies (e.g., Net-Zero Emissions Act, Greener Homes Program) signal intent but may exclude low-income households due to up-front cost barriers.

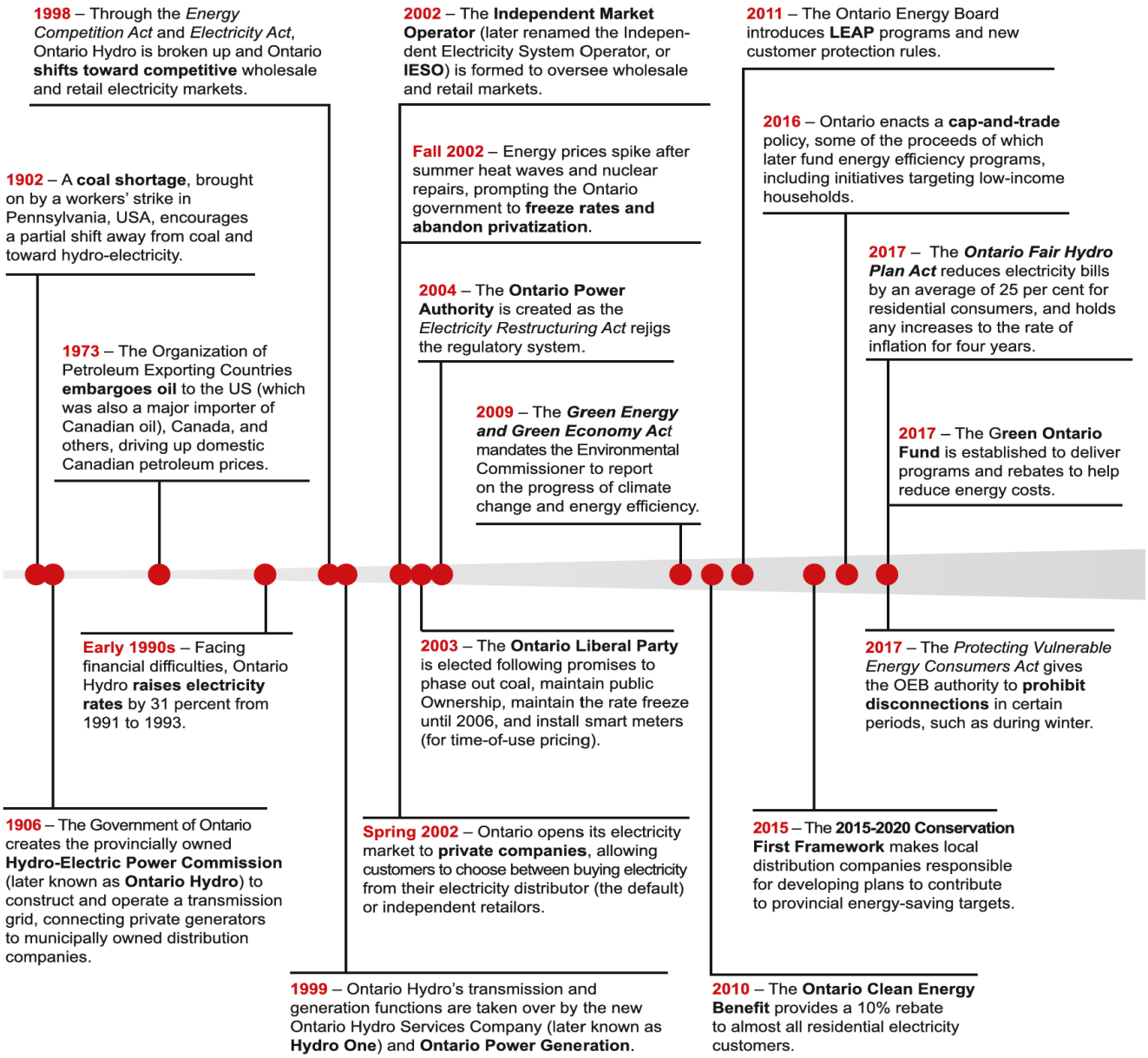


Figure 5: Timeline of significant policies and events in Ontario impacting energy users (Das et al., 2022)

2.4.2 Community Experiences in Ontario's Energy Transitions

Energy justice, as outlined by Sovacool and Dworkin (2015), seeks to balance the distribution of energy benefits and costs fairly among all communities, especially protecting the interests of the poor and marginalized by promoting access to modern energy services. In Canada, particularly in Ontario, energy justice faces numerous challenges, including energy poverty, which lacks clear conceptualization, leading to minimal policy focus (Das et al., 2022). Ontario's energy transition has been shaped not only by infrastructure and policy, but also by the lived experiences and participation of communities directly impacted by energy projects. Despite the potential for renewable energy initiatives, the transition has at times worsened inequities and strained relationships between governments, developers, and local populations.

Notable examples include the contested Line 9 pipeline, which ran through the territory of the Chippewas of the Thames. The Nation challenged the project on the grounds of insufficient consultation and recognition of their treaty rights. Despite their appeal, the Supreme Court upheld the project, sparking deep frustration and exposing institutional failures in recognizing Indigenous autonomy and procedural justice (Hunsberger & Awâsis, 2019). Similarly, Aamjiwnaang First Nation's proximity to Sarnia's Chemical Valley, one of Canada's most toxic industrial zones, demonstrates the cumulative burden of environmental harm on marginalized communities. Residents have experienced elevated rates of illness, miscarriage, and cancer, due in part to Ontario's pollution permitting regime that fails to account for the oversaturated airshed or cumulative impacts (D. N. Scott, 2024).

The Green Energy and Green Economy Act (GEGEA) of 2009 in Ontario, although aiming to advance wind energy, sparked considerable social conflict due to health and environmental impacts (Songsore & Buzzelli, 2016; Whiteley & Dumbrille, 2021). In places like Kawartha Lakes

and across rural Ontario, this top-down planning approach triggered protests and spurred coordinated resistance. Many residents reported that developers provided little information, held tokenistic open houses, and failed to respect local identities and concerns (Fast & Mabee, 2015; Shaw et al., 2015). These conflicts were exacerbated by a lack of meaningful community engagement and procedural justice, causing substantial local opposition and legal disputes (Whiteley et al., 2021).

A comparative analysis by Tarhan (2022) and Hoicka et al. (2022) highlights the disparity in community renewable energy initiatives (CRE), which, despite their potential, often fail to include marginalized communities, thus not fully addressing social justice concerns. CRE development in Ontario has been hindered by a combination of centralized energy system legacies and policy instability, which has raised the technical, financial, and regulatory thresholds required for participation (Tarhan, 2022). As a result, many marginalized communities are excluded from CRE opportunities due to limited access to what Tarhan (2022) calls "practical capacities," namely, time, money, and expertise. These disparities exist both between communities and within them, especially when CRE organizations restrict governance or ownership to individuals already possessing such capacities. This exclusivity can unintentionally deepen intra-community inequities.

Ontario's Feed-in Tariff (FIT) program illustrates these tensions. Despite its intention to foster collective ownership, FIT 1.0 exposed CRE groups to direct competition with investor-owned firms in a first-come-first-served system, disadvantaging those with slower start-up timelines or less capital (McMurtry & Tarhan, 2019; Ting Du, 2021). Although grant funding and price calculators were introduced, they did not adequately account for systemic disparities in CRE readiness. Many communities lacked access to legal, financial, and technical networks that affluent

actors more easily mobilized (Huybrechts & Mertens, 2014; Park, 2012). Consequently, the program struggled to deliver on its justice potential.

In a study conducted by Calvert et al. (2022), which involved examining planning policy documents from multiple municipalities in Ontario, it was discovered that these documents lacked any mention related to energy transitions within both overarching planning objectives and specific policy provisions. This absence persists despite the considerable potential that human-centered aspects could offer to the socio-technical landscape of the energy sector. The presence of predominantly white and male leadership in Ontario's Renewable Energy Co-ops further emphasizes this exclusion, reflecting broader patterns of underrepresentation along both racial and gender lines (Tarhan, 2022). Additionally, a policy review by Das et al. (2022) on addressing energy poverty in Ontario underscores the inconsistency in policy application due to the ambiguous definition of 'energy poverty', leading to inadequate support for affected households. This is compounded by the general absence of energy transition considerations in the Official Plans for rural municipalities, indicating a lack of prioritization by policymakers (Calvert et al., 2022).

Ontario's initiatives in renewable energy and energy policy reform reflect a complex interplay of environmental, economic, and social factors. Yet, existing frameworks often lack the necessary integration of justice-oriented perspectives, particularly those grounded in environmental justice, climate justice, and energy justice. Each of these traditions offers distinct but overlapping insights: environmental justice foregrounds the uneven distribution of environmental harms, climate justice highlights the disproportionate impacts of climate change and mitigation strategies, while energy justice focuses on the fair distribution of energy’s benefits and burdens, inclusive participation, and historical redress. An intersectional approach, which considers how factors such as race, gender, class, and geography compound vulnerability, is essential for understanding these layered

injustices. While policy efforts tend to center on the efficient delivery of infrastructure and services, incorporating these justice frameworks could illuminate critical blind spots and advance a more holistic, equity-focused, and community-engaged energy transition. Achieving a truly sustainable and inclusive energy future in Ontario thus requires comprehensive reforms and a multivalent policy framework that actively involves marginalized communities and addresses the nuances of the disparities (Cuenca et al., 2023; Hamstead et al., 2021; Madlener & Sunak, 2011).

2.4.3 Examples and Critiques of Current Policy Framing and Governance

While Ontario has demonstrated leadership in phasing out coal and investing in renewables, critiques of its energy governance reveal persistent systemic flaws. Current policy frameworks often prioritize economic growth and investment certainty at the expense of procedural, distributive, and recognition-based justice. Critiques of Ontario's energy strategy highlight the ongoing struggle to balance green power initiatives with economic considerations, where higher green power costs could lead to consumer resistance and a decline in support for regulated renewable initiatives (Das et al., 2022; Klein, 2015). Moreover, the province's approach has been marked by inequity, especially among Indigenous communities, where restricted access to resources is compounded by the historical and ongoing theft of land and the undermining of sovereignty (Alook et al., 2023; Karanasios & Parker, 2017). However, opportunities for Indigenous participation in renewable energy projects exist, supported by the Green Energy Act through initiatives like the Feed-In-Tariff program and financial mechanisms such as the Aboriginal Loan Guarantee Program (Karanasios & Parker, 2017; Story & Lickers, 1997).

The Line 9 pipeline case exemplifies how institutional mandates and legal interpretations of consultation diverge sharply from Indigenous understandings of justice and sovereignty. The National Energy Board (NEB) and Supreme Court processes narrowly interpreted procedural

fairness, failing to account for historical grievances, Indigenous legal orders, or substantive engagement (Hunsberger & Awâsis, 2019). This reflects a broader trend where regulatory bodies privilege technocratic knowledge and limit the role of lived experience, particularly that of Indigenous and marginalized communities (Heffron & McCauley, 2017; Jenkins et al., 2016).

The Green Energy Act of 2009 further illustrates these governance gaps. While it succeeded in attracting renewable energy investment, its centralization of approval authority stripped municipalities of decision-making power. As a result, trusted local actors, including planners, councils, and community organizations, were removed from the process, reducing transparency and weakening accountability (Fast & Mabee, 2015; Shaw et al., 2015). The resulting disconnect raised adversarial relationships between developers and communities, turning potential support into resistance.

Ontario's Feed-in Tariff (FIT) program, while intended to democratize energy generation, disproportionately benefited actors with existing financial and technical capacity, placing community renewable energy (CRE) initiatives at a disadvantage (Tarhan, 2022; Ting Du, 2021). The program's competitive structure and complex requirements limited access for marginalized groups, who often lacked the resources to navigate feasibility studies, regulations, and fundraising (Huybrechts & Mertens, 2014; Park, 2012). This failure underscores a broader governance issue: the lack of participatory design and equity-driven planning in provincial energy policy.

While CRE has the potential to advance economic development and reduce energy poverty (Forman, 2017; Joshi & Yenneti, 2020), policy frameworks have yet to recognize or support these benefits in a meaningful and inclusive manner. At the municipal level, local planning frameworks similarly reflect a limited governance vision. Analysis of rural Official Plans (OPs) reveals that strategic thinking around energy transition is almost entirely absent. This reflects a policy structure

that systematically deprioritizes local agency and reinforces jurisdictional fragmentation, a significant barrier to implementing equitable, context-sensitive energy transitions (Calvert et al., 2022). In most cases, municipalities defer responsibility to provincial regulations, limiting their own role in driving or shaping energy transition outcomes.

Moreover, energy planning frameworks have not effectively addressed spatial justice. Rural communities bear disproportionate burdens from infrastructure siting yet receive limited economic benefits. In many cases, multinational corporations and investors have reaped the rewards, while host communities feel alienated (Das et al., 2022; Shaw et al., 2015). The lack of binding environmental standards, as seen in the case of Aamjiwnaang First Nation, further points to a policy system that is ill-equipped to deal with cumulative harm or to recognize the lived realities of frontline communities. Several scholars and expert panels have recommended systemic reforms, such as strategic environmental assessments that integrate regional and Indigenous knowledge, hybrid approval processes that blend top-down coordination with bottom-up agency, and just transition measures that emphasize fairness and inclusivity (Gajevic Sayegh et al., 2025; Mulvihill et al., 2013).

2.5 Variables Influencing Energy Justice Perceptions

To meaningfully embed equity into energy decision-making processes, we must first understand where perceptions of justice diverge, and why. While the previous section highlighted the structural and procedural limitations within Ontario's energy governance, this section builds on that by shifting focus to the social variables that shape how justice is interpreted by different actors. It explores how intersecting factors such as gender, age, social position, and institutional role influence energy justice perceptions and priorities. By identifying these patterns, the discussion highlights both the limits of one-size-fits-all policy approaches and the need for more

inclusive, context-responsive frameworks. Energy justice, although widely discussed in academic literature, is yet to be effectively adopted by policymakers in ways that embed justice principles into the design and implementation of energy policy (Fuller & McCauley, 2016; Heffron & McCauley, 2017; Simcock & Bouzarovski, 2025; Williams & Doyon, 2024). Even as justice-oriented discourses grow, the meanings attributed to energy justice are shaped by shifting political, cultural, and social contexts (Jenkins et al., 2016; Newell et al., 2022; Sovacool et al., 2022).

In many Northern contexts, energy systems are frequently treated as gender-neutral, with assumptions that women and men engage with energy systems in similar ways. This perception has contributed to the invisibility of gender within energy policy and decision-making in the Global North (Clancy & Roehr, 2003; Feenstra & Özerol, 2021; Robinson et al., 2023). Additionally, while the literature on gender, energy, and climate change has focused predominantly on women's access to energy in the Global South (Fathallah & Pyakurel, 2020; Listo, 2018), research into gendered engagement and leadership in renewable energy in the Global North remains limited (Anfinsen & Heidenreich, 2017; Fraune, 2016; Tjørring, 2016). The majority of gender-energy studies are grounded in empirical data from the Global South, whereas energy justice research typically stems from the Global North (Feenstra & Özerol, 2021; Lazoroska et al., 2021; Robinson et al., 2023). By bridging these two streams, scholars can foster a more integrated understanding of global gender disparities and broader socio-technical injustices in energy systems, while accounting for important contextual differences.

Notably, the gender-energy justice debate reflects the complexity of these interrelations: while gender inequalities are documented throughout energy systems (Feenstra & Özerol, 2021; Robinson et al., 2023), structural inequities remain underexamined. At various levels, gendered power asymmetries manifest as procedural and distributive injustices. Although the appointment

of women to leadership roles is often proposed as a solution, Clancy et al. (2017) argue that deeper structural changes are necessary to meaningfully stimulate energy policy. Procedural justice, as Robinson et al. (2023) emphasize should extend beyond numerical representation to include equitable participation throughout all phases of policy development.

A gendered lens also reveals that household-level energy injustices are often obscured by assumptions of shared intra-household resource access (Herrero, 2017). This risks ignoring women's limited decision-making power regarding energy practices and technologies in the home (Mechlenborg & Gram-Hanssen, 2020; Robinson et al., 2023). There exist gender disparities in the energy industry as well. Women are globally underrepresented in both the energy workforce (Allison et al., 2019; Baruah, 2017; Pearl-Martinez & Stephens, 2017) and in shaping energy transitions. In the Global North, energy has long been framed as gender-neutral, masking gendered exclusions from energy governance and technical domains (Clancy & Roehr, 2003). Social norms continue to associate energy technologies with masculinity, which can discourage women's participation (Fathallah & Pyakurel, 2020; Tjørring, 2016).

Beyond gender, intersectionality offers a valuable framework to explore how social categories such as class, ethnicity, and age shape perceptions of energy justice. Despite the potential of this lens, it has rarely been explicitly applied in energy justice research. Its integration could provide insights into how interlocking structures of inequality affect access, participation, and perceptions of fairness in energy systems (Mejía-Montero et al., 2023). Intersectionality also bridges research with activism, enabling more grounded and impactful policy interventions that align with grassroots concerns (Robinson et al., 2023). Recognizing the compounded vulnerabilities of marginalized communities, such as racialized women or low-income migrants, underscores the

need for energy justice frameworks that account for complex social identities (Fuller & McCauley, 2016; Lee & Byrne, 2019).

Age also influences how individuals relate to and perceive energy systems. Youth may be more attuned to environmental justice discourses and demand participatory solutions, while older populations may experience access barriers due to digital exclusion or physical limitations (Henriksen et al., 2025). Gender intersects with these dynamics: although studies suggest women are more inclined toward energy conservation and flexibility practices (Clancy & Roehr, 2003; Henriksen et al., 2025), real-life constraints, such as unequal domestic responsibilities, can hinder their participation in energy-saving behaviors (Tjørring et al., 2018).

Finally, occupational and institutional settings shape energy justice engagement. The translation of energy justice into actionable policy remains limited by bureaucratic inertia, technocratic norms, and institutional priorities that often exclude social justice concerns (Heffron & McCauley, 2017). Despite a growing awareness of vulnerable groups within energy poverty literature, institutional frameworks have yet to consistently recognize or address these populations through targeted interventions (Fuller & McCauley, 2016). Lee & Byrne (2019) note that dominant energy institutions must undergo structural reform to integrate equity and justice as central operational principles. Without this, energy policy risks remaining disconnected from the realities of those most affected by energy transitions.

Overall, the literature suggests that energy justice perceptions are mediated by intersecting identities and institutional positions. Engendering energy policy, applying intersectionality, and restructuring institutional practice are essential to designing equitable energy systems. Acknowledging and operationalizing these variables within policy frameworks is vital to achieving fair, inclusive, and sustainable energy transitions.

In conclusion, bridging the existing gap in energy justice research by developing and applying comprehensive justice metrics within technical and policy realms is not only a necessary advancement for the field but a crucial step toward a more equitable and sustainable energy future. Ontario's experience with the Green Energy Act, in particular, illustrates how centralized, technocratic governance can undermine procedural and recognition justice by sidelining lived experience and excluding trusted local actors, ultimately transforming potential support into resistance.

Altogether, these critiques suggest that while Ontario's policy agenda has successfully mobilized capital and infrastructure for energy transition, it has done so through governance frameworks that often neglect justice considerations. To foster a more equitable and sustainable energy transition, it is essential to adapt energy grids to support diverse renewable projects and promote systemic changes in the energy sector that prioritize environmental considerations alongside trade and economic policies (Hoang et al., 2021; Whiteley et al., 2021). For a truly sustainable and inclusive energy future, Ontario must recalibrate its decision-making processes to prioritize equity, recognize diversity, and empower local agency in shaping the province's energy landscape.

To address these challenges, the next chapter outlines the methodological approach used to gather and analyze expert perspectives on how equity can be more effectively embedded into Ontario's energy decision-making processes.

Chapter 3: Methods

3.1 Research Approach & Design

In aligning with the research topic, a pragmatic philosophical worldview is adopted. The practical applications of ideas are emphasized by placing a strong emphasis on problem-solving and the application of knowledge, highlighting the importance of focusing on the research problem and then selecting methods that are best suited to address it (Creswell & Creswell, 2022). A qualitative approach is most appropriate for this study, as it enables an in-depth exploration of complex, context-dependent issues such as perceptions of equity, the lived experiences of marginalized communities, and the socio-political nuances of Ontario's energy transition, insights that cannot be easily quantified.

This research employs a qualitative design, incorporating a survey with data analysis through thematic coding. This approach improves the study's comprehensiveness and is particularly well-suited to addressing the layered and dynamic nature of energy justice. By using qualitative methods within a pragmatic framework, this study ensures that both theoretical inquiry and real-world application are central to the research approach. This approach enables the analysis to generate actionable insights and policy-relevant findings while remaining grounded in the lived realities of the communities and stakeholders most affected by energy sector transformation in Ontario.

3.2 Data Collection Methods

To support a comprehensive exploration of equity considerations within Ontario's energy sector transformation, this study employed a qualitative approach to data collection. A survey served as the primary method of data collection, chosen for its ability to capture multiple

dimensions of the research problem and to anchor the findings in both empirical evidence and established scholarly and policy frameworks.

The survey was designed to gather insights on current energy sector practices in Ontario, including renewable energy transitions, current equity considerations, as well as the challenges and solutions to an inclusive energy future. Another objective of the study was also to develop a set of equity indicators grounded in expert insights that could be used to evaluate and more effectively integrate equity into Ontario's energy policy and planning processes. Participants were assigned unique identification codes to maintain confidentiality while enabling traceability for analysis. The survey findings were instrumental in validating existing energy justice indicators and identifying potential new ones.

While surveys were the primary method of data collection, in two cases, semi-structured interviews were conducted: one with a survey respondent seeking to elaborate on their responses, and one with an additional expert unable to complete the survey online. A comprehensive literature review was also conducted at the beginning of the research and continued throughout the data collection, analysis, and writing phases. This process involved an extensive review of both academic and non-academic sources, including peer-reviewed journal articles, government reports, etc., with a focus on building a strong foundational understanding of energy justice, its core tenets (distributional, procedural, recognition, and restorative justice), and the development of relevant equity indicators. The insights gained from this review directly informed the design of the survey and semi-structured interview guides, ensuring alignment with established theoretical frameworks while remaining grounded in practical relevance. As such, the literature review functioned not only as background research but also as an ongoing analytical tool throughout the study.

3.3 The Survey

3.3.1 Selection Criteria & Rationale for Using Expert Surveys

Given the scope of this master's thesis, conducting interviews and surveys with directly impacted community members would have been ideal to center lived experiences in the analysis. However, due to the lack of existing community connections and the logistical constraints of a two-year research project, the study employed a pragmatic approach by focusing on expert participants, including professionals with relevant experience and insights into Ontario's energy sector and equity-related issues.

To ensure diversity and relevance, purposeful sampling and snowball sampling (Creswell & Creswell, 2022) were employed to recruit participants from a range of backgrounds, including energy industry professionals, policymakers, activists, and scholars. These individuals were selected to represent a broad cross-section of expertise across technical, regulatory, and justice-oriented domains within Ontario's energy transition.

The target sample size for this study was 15 participants, purposefully selected to ensure representation from three key expert groups: industry experts (5–10 participants), activists/scholars (3–5 participants), and policymakers (3–5 participants). A larger proportion of industry experts was included to capture technical and operational insights into Ontario's energy systems, while perspectives from activists, scholars, and policymakers ensured that social, environmental, and governance considerations were equally represented. Industry experts were included if they had a minimum of five years of experience in the energy sector, particularly with renewable energy, and had held professional roles in energy companies, consultancy firms, or research institutions. Activists and scholars were selected based on at least three years of active

involvement in advocacy, community organizing, or academic research related to energy or environmental justice within Ontario, with affiliations to NGOs, grassroots organizations, and academic institutions. Policymakers included individuals with at least three years of experience in energy or environmental policymaking at the municipal, provincial, or federal levels, particularly those involved in developing or implementing Ontario's energy policies. Participants were excluded if they lacked relevant experience, had conflicts of interest, operated outside Ontario, or were bound by non-disclosure agreements that restricted open participation.

For this study, an 'energy expert' was defined as an individual with at least three to five years of professional, academic, or advocacy experience in Ontario's energy sector, including but not limited to policy development, regulation, generation, distribution, community engagement, and social or environmental justice. Purposeful sampling was appropriate to ensure inclusion of participants with direct and relevant expertise, while snowball sampling facilitated the identification of additional individuals whose perspectives would enrich the diversity of roles and experiences represented. This combination allowed the study to capture perspectives from technical, policy, and justice-oriented domains, producing a participant group capable of providing nuanced and context-specific insights. Table 3 summarizes the distribution of expertise areas represented in the participant group, while Table 4 provides the participants' demographics. Participants were chosen based on their relevance to Ontario's energy sector and their ability to provide nuanced insights into the intersection of energy policy and equity.

Table 3: Distribution of Participant Expertise

Field of Expertise	Number of Participants
Community Engagement	8
Policy and Regulation	6
Social Justice and Equity	4
Renewable Energy	4

Other (Please Specify)	2

Table 4: Participant Demographics

Participant ID	Gender	Energy Sector	Years of Experience
CE1	Female	Community Engagement	Less than 5 years
CE2	Female	Community Engagement	10-20 years
CL 1	Female	Other: Climate	10-20 years
PR1	Male	Policy and Regulation	10-20 years
PR2	Female	Policy and Regulation	10-20 years
PR3	Male	Policy and Regulation	More than 20 years
RE1	Male	Renewable Energy	More than 20 years
SJ1	Female	Social Justice and Equity	Less than 5 years
MX1	Female	Renewable Energy Community Engagement	10-20 years
MX2	Male	Renewable Energy Community Engagement Policy and Regulation	10-20 years
MX3	Male	Policy and Regulation Other: Integrated planning	More than 20 years
MX4	Female	Social Justice and Equity Community Engagement	Less than 5 years
MX5	Female	Social Justice and Equity Community Engagement	Less than 5 years
MX6	Male	Community Engagement Renewable Energy	More than 20 years
MX7	Male	Policy and Regulation Social Justice and Equity Community Engagement	More than 20 years

3.3.2 Participant Recruitment

Participants were recruited through a combination of direct email outreach and professional network referrals, using both purposeful and snowball sampling techniques. Initial participants were identified through professional directories and existing institutional contacts. Once surveys

were conducted, additional participants were recommended by initial participants as well as individuals who were interested but didn't have the capacity to participate, allowing for the identification of individuals with relevant and diverse expertise.

Recruitment took place via email, targeting professionals affiliated with key institutions such as the Nuclear Innovation Institute and Ontario Power Generation, as well as relevant NGOs and government bodies. These organizations were selected based on their active involvement in Ontario's energy sector and their relevance to both policy and practice. Where participants were members of an organization, care was taken to ensure voluntary participation, and ethical research practices were followed.

Recruitment took place from January to the end of April 2025, beginning with purposeful sampling and followed by snowball sampling to reach the required number of participants and ensure diversity in perspectives. In total, 37 potential participants were invited via email, of whom 14 agreed to participate, alongside one additional expert who took part in a semi-structured interview, resulting in 15 expert contributions. Of these, 9 provided responses in bullet-point form and 5 in paragraph form, with one delivered through semi-structured interviews. Combined, the responses amounted to approximately 25,084 words, with individual submissions ranging from 450 to 2,300 words. This variation in format and length reflects differences in respondent communication styles and availability, but all addressed the full set of survey questions, providing both breadth and depth for thematic analysis. Table 5 summarizes the recruitment process and participant formats

Table 5: Summary of Participant Recruitment

Recruitment Stage	Count	Notes
Invited	27	Initial emails sent to targeted experts via purposeful sampling
Referred via snowballing	10	Identified by existing participants to get desired number of participants and enhance diversity
Completed Survey	14	9 bullet-point form, 5 paragraph form
Semi-structured Interviews	2	1 follow-up with survey participant, 1 new expert opting for interview over survey

3.3.3 Survey Design

The survey was designed using Qualtrics, a secure, web-based platform that facilitated both distribution and response management. The survey consisted primarily of open-ended questions, allowing participants to provide in-depth reflections on current equity practices in the energy sector, particularly in the areas of renewable energy transitions, energy justice policies, equity considerations, and policies and decision-making processes. It also included multiple-choice and rating-scale (Likert scale) questions, which were often accompanied by follow-up prompts asking participants to explain the reasoning behind their selections. The full survey instrument is provided in Appendix B for reference. The survey questions were rephrased and adapted for use in the semi-structured interviews to ensure consistency while allowing for deeper exploration of participant perspectives.

The questions were informed by insights from the literature and structured around key energy justice tenets and equity indicators. This ensured that the questions were grounded in existing theoretical frameworks while also allowing room for respondents to introduce new or context-specific considerations. The survey was designed with a consistent set of questions for all participants, ensuring a standardized approach while still allowing for diverse perspectives based on each respondent's background and expertise.

Responses were anonymized using unique participant IDs and were downloaded from Qualtrics for subsequent analysis. The survey results helped surface patterns and common themes.

3.4 Data Analysis Methods

Given the qualitative nature of the study, a thematic analysis approach was employed to examine the collected data. Thematic analysis is well-suited for identifying, analyzing, and reporting patterns within qualitative data, enabling both inductive and deductive interpretation (Creswell & Creswell, 2022). Participants were asked to reflect on a range of themes, including challenges facing Ontario's energy transition, proposed solutions, barriers encountered by vulnerable communities, key equity considerations, and the relevance and application of energy justice indicators and criteria in policy and decision-making. Their responses were subsequently downloaded and organized for review.

To begin the analysis, all responses were thoroughly reviewed to establish familiarity with the data. A systematic coding process was then carried out using NVivo, a qualitative data analysis software that facilitated the creation, refinement, and organization of codes. These codes were developed to capture recurring ideas, key concepts, and meaningful insights related to equity within Ontario's energy transition. Codes were then grouped into broader themes, which were iteratively reviewed and refined to ensure coherence, internal consistency, and representativeness across the dataset. The resulting themes provided a structured yet nuanced understanding of how energy justice is conceptualized, experienced, and operationalized by different expert groups, forming the basis for the study's findings and policy recommendations.

3.5 Ethical Considerations

3.5.1 Positionality

As an international student not directly experienced with the central issues of this study on energy justice, my external perspective offers both challenges and unique strengths. My external perspective might limit my intuitive understanding of the nuances specific to the local context. However, it also allows me to approach the data with a fresh viewpoint, potentially uncovering insights that might be overlooked by someone more ingrained within the context. Acknowledging the influence of my cultural background, educational path, and the fact that I am not a native to the issues at hand might lead me to interpret data differently, possibly emphasizing certain themes over others unconsciously.

While I initially intended to document the evolution of my understanding throughout the research process, in practice, I engaged more reflexively through ongoing discussions with my supervisors and critical reflection during data analysis. As my familiarity with the findings deepened, these dialogues helped sharpen my interpretation, challenge my assumptions, and ensured that my analysis remained grounded in the local context. Additionally, my academic background and skills in critical thinking and data analysis equip me to systematically compare and analyze data from various sources, enhancing the validity of the research. By explicitly addressing these aspects of reflexivity, I aim to conduct a robust study that advances the understanding of energy justice and adheres to rigorous academic standards, offering valuable insights irrespective of my initial familiarity with specific issues.

3.5.2 Validity and Reliability Strategies

In qualitative research, validity strategies refer to methods that researchers employ to show and persuade readers of the accuracy of their findings. Triangulating data through establishing themes by combining multiple perspectives from the participants enhances the validity of the study (Creswell & Creswell, 2022). This study employed data triangulation to ensure the validity of its findings by drawing on multiple sources of evidence. It compared the effectiveness of existing energy justice indicators with those proposed by participants, assessed the need for additional indicators, and evaluated the consistency of these across expert responses. Additionally, it examined how equity is defined in policy documents versus how it is understood and applied by experts, revealing key areas of alignment as well as disconnect. This multi-layered approach provided a more comprehensive and grounded understanding of how equity is addressed within Ontario's energy decision-making processes. Additionally, it will also clarify researcher bias and reflexivity, to ensure the findings are robust and reliable. To add to the reliability of the data, there will be small assessments and reviews by supervisors.

3.5.3 Confidentiality & Data Protection

To ensure the ethical handling of participant information, confidentiality and data protection measures were strictly observed throughout the study. Basic demographic information like participant occupation, gender, and years of experience were collected to provide context for the analysis, but no names or personally identifying information were linked to this demographic data. As such, the collection of identifying information was not applicable to this study. In all written materials and the presentation of findings, participants are referred to either using their participant IDs or in generalized terms such as participants, experts, or respondents to maintain confidentiality.

3.6 Limitations

This research proposal, focusing exclusively on Ontario's energy sector, may encounter limitations due to its geographical specificity, which could restrict the generalizability of findings to other regions. Challenges in participant representation might skew perspectives, particularly if some stakeholder voices are underrepresented. The selection of industry experts might not be entirely representative of all stakeholders in Ontario's energy sector. This could lead to an overemphasis on particular viewpoints or missing critical perspectives, especially from less vocal or harder-to-reach segments.

While the study draws on insights from a diverse group of industry experts, it is important to acknowledge that their perspectives may not fully represent the views of the broader communities or stakeholder groups they are associated with. As such, the findings reflect expert interpretations of equity in Ontario's energy sector, which may differ from the lived experiences or priorities of affected communities. This limitation should be considered when interpreting the applicability and generalizability of the results. Additionally, the resources available and time constraints might also limit the depth of data collection and analysis, affecting the study's thoroughness. Lastly, the inherently complex and subjective nature of defining and measuring equity could complicate the analysis and implementation of identified equity criteria. By acknowledging these limitations, the research aims to carefully navigate these challenges through methodical planning and reflexivity. These considerations will also guide the interpretation and application of the research outcomes, ensuring they are understood within the appropriate context and constraints.

Chapter 4: Results

This chapter presents the key findings from the survey conducted with a total of 15 participants. The research aimed to examine how principles of equity and justice are understood, prioritized, and integrated within Ontario's energy transition, particularly in the province's shift from fossil fuels as the dominant energy source towards more sustainable and renewable energy sources. In doing so, the chapter addresses the central research question:

- How are equity considerations currently, and how could they be, integrated into energy decision-making processes in Ontario to support a more just and inclusive energy transition?

The overarching aim of this research is to examine how equity considerations, grounded in energy justice principles, can be meaningfully integrated into Ontario's energy decision-making processes. To achieve this, the study pursues three interrelated objectives. First, to explore how energy experts in Ontario view equity and assess its relevance in current policy and planning contexts. Second, to identify and refine a set of equity indicators based on expert insights. Third, to apply these indicators to evaluate existing energy policies and practices, highlighting both areas of progress and persistent gaps in advancing a just and inclusive energy transition.

Where sections 2.4.1 Equity Considerations in Energy Policy and 2.4.3 Examples and Critiques of Current Policy Framing and Governance of the literature review outlined the government's stated goals and actions in Ontario's energy transition, this chapter presents insights from a range of experts who reflect on the equity implications of those efforts. This chapter begins with an overview of the participants, outlining how they were selected and their areas of expertise. Following this, the chapter presents an overview of the survey responses, followed by the major themes that emerged from the analysis of participant responses. These themes are supported by

direct quotes from participants and visual summaries to provide transparency and accountability in interpreting the findings.

4.1 Overview of Participants

A total of 15 experts participated in this study, primarily through a structured survey. In two cases, semi-structured interviews were conducted, one with a survey respondent seeking to elaborate on their responses, and one with an expert who preferred to respond to the survey questions via interview. The study engaged professionals across a broad spectrum of energy-related domains, including policy, advocacy, research, and technical fields. Many participants hold decision-making roles or work closely with Ontario's energy systems, offering perspectives that blend institutional knowledge with on-the-ground experience in addressing equity gaps. Many participants held cross-cutting expertise in more than one domain. The participants brought a wide range of experience levels to the study, with backgrounds spanning from less than 5 years to over 20 years in their respective fields. Their insights reflect the complexity and diversity of equity considerations in Ontario's transition toward more sustainable and inclusive energy systems.

The participant group represented a diverse cross-section of backgrounds relevant to Ontario's energy transition. Those working in community engagement (CE) included individuals based in municipal governments and grassroots organizations, reflecting both institutional and community-level perspectives. Policy and regulation (PR) experts held roles in provincial agencies, regulatory bodies, and environmental consultancies, offering insights into governance and planning structures. Participants with expertise in social justice and equity (SJ) were affiliated with advocacy organizations, academic institutions, and Indigenous-led initiatives, bringing critical perspectives on systemic exclusion and rights-based approaches. Renewable energy professionals (RE) worked in solar, wind, and distributed energy sectors, ranging from project development to

policy advising. The ‘Other’ category included individuals whose expertise spanned multiple sectors (MX) or came from adjacent domains such as environmental law and energy finance.

4.2 Overview of Participant Responses

Participants consistently emphasized the urgent need to embed equity more deeply into Ontario’s energy transition. Energy justice was broadly framed as a multidimensional concern, encompassing not only economic and environmental factors but also social inclusion and procedural fairness. The responses revealed a strong consensus that current approaches to energy planning and policy in Ontario fall short in addressing equity, particularly in how decisions are made and whose voices are included.

A dominant concern across responses was that equity is not meaningfully integrated into the policy, design, or implementation stages of Ontario’s energy system transformation. Participants highlighted affordability, access to timely and transparent information, and the active inclusion of marginalized communities as key gaps. Groups most frequently cited as being underserved or overlooked include Indigenous communities, low-income households, rural communities, renters, and, by extension, urban communities.

Procedural justice, how decisions are made, emerged as a central theme. Many participants criticized the province’s energy governance as overly centralized and siloed, noting that current decision-making structures are top-down and often exclude community voices. There were repeated calls for more inclusive, participatory policy design processes that recognize and respond to the needs of historically marginalized populations.

While participants came from a variety of backgrounds, including policy, community engagement, renewable energy, and regulatory fields, the tone and content of responses often

reflected their professional orientation. For example, social justice advocates and community organizers were especially vocal about the disconnect between policy rhetoric and lived experiences on the ground.

Although there was broad agreement on key equity concerns, such as the importance of Indigenous inclusion and affordability, participants differed in their proposed solutions. Some emphasized technocratic and economic responses, such as the creation of green jobs and investment in distributed energy systems. Others focused on community empowerment and long-term justice outcomes, highlighting the importance of building capacity within marginalized groups to participate fully in the energy transition. These overarching concerns form the foundation for the key findings and thematic analysis presented in the subsequent sections, which delve into key dimensions of equity in greater depth. It is important to keep in mind that these findings reflect the perspectives of experts who work on, or study issues related to energy justice, rather than direct testimony from the affected communities themselves.

4.3 Ontario's Context

This section sets the stage for the findings by situating the study in its geographical and political context. It addresses energy justice in Ontario and the groups that are rendered vulnerable in the energy sector's transformation. It highlights the challenges identified by participants and the possible solutions. The findings reveal a set of interconnected concerns linking the energy transition to broader equity issues in both policy and practice.

4.3.1 Transition Context & Regional Focus

I. Energy Justice in Ontario

A majority of participants (10 of 15), spanning community engagement specialists, policy experts, and social justice advocates, described energy justice as a multifaceted and deeply contextual concept that merges principles of equity, participation, and historical reparations. Central to their understanding was the belief that clean, reliable, and affordable energy access must be guaranteed to all, particularly communities historically excluded from governance and decision-making processes.

Participant MX1 elaborated on this view as ensuring "*fair access to clean, affordable energy while addressing past and present inequalities,*" with equitable distribution of transition costs and benefits, meaningful community participation, and upholding Free, Prior, and Informed Consent (FPIC) for Indigenous peoples. Community engagement experts CE1 and CE2 framed energy justice within the broader context of the climate crisis and politics. CE1 emphasized the need for accountable governance to counter climate denial. ("*Without media accountability to counter climate denial and industry disinformation, the public remains misinformed, leading to the election of leaders who fail to support fair, science-based climate decision.*"), while CE2 stressed on a systemic vision encompassing "*ecological integrity (which includes decarbonization), energy security, energy resilience, and energy democracy.*"

Several participants (6 of 15) identified obstacles such as outdated governance models, corporate influence, and barriers embedded in policy and program design. For instance, MX5 noted that working with marginalized communities "*illuminates the barriers faced*" due to program design, while CE2 argued that "*corporate-dominated structures*" require reimagining for equitable benefit distribution. Expert CL1 went further to highlight that not everyone is equally

recognized in policy and planning, stating that "*The province doesn't really seem to work for the betterment of anyone except suburban citizens.*" Participants MX7 and PR3 supported this by further highlighting the unequal distribution of burdens and benefits. MX7 reflected that "*low-income households and renters are most at risk in the transition,*" noting the inequity of receiving a rebate for energy updates simply because he was aware of the inventive and could finance them upfront. PR3 emphasized that "*ratepayers have equal and fair access to electricity and should be afforded the ability to influence choice,*" stressing that utilities must anticipate evolving customer needs to serve all ratepayers equally.

Having outlined expert perspectives on the meaning and importance of energy justice in Ontario's transition, the next section turns to the question of who is most at risk, highlighting the vulnerable groups that participants identified as being disproportionately affected.

II. Vulnerable Groups in the Transition

Almost all participants (14 of 15) identified renters and low-income households as the most at risk in Ontario's energy transition, followed closely by rural (11 participants) and Indigenous communities (10 participants). Figure 6 illustrates participant responses to which groups they believe are most at risk of being overlooked. While PR2 acknowledged that "*more has been done recently to advance Indigenous ownership in generation and transmission projects so that seems to be on a good track,*" SJ1 highlighted ongoing environmental harms noting "*concerns about nuclear waste being disposed of in Indigenous communities, the ongoing costs of relying on so-called 'natural' gas, and the preference for nuclear energy over investments in energy efficiency.*"

This pattern underscores a shared perception that equity gaps are concentrated among groups historically marginalized in energy planning and decision-making.

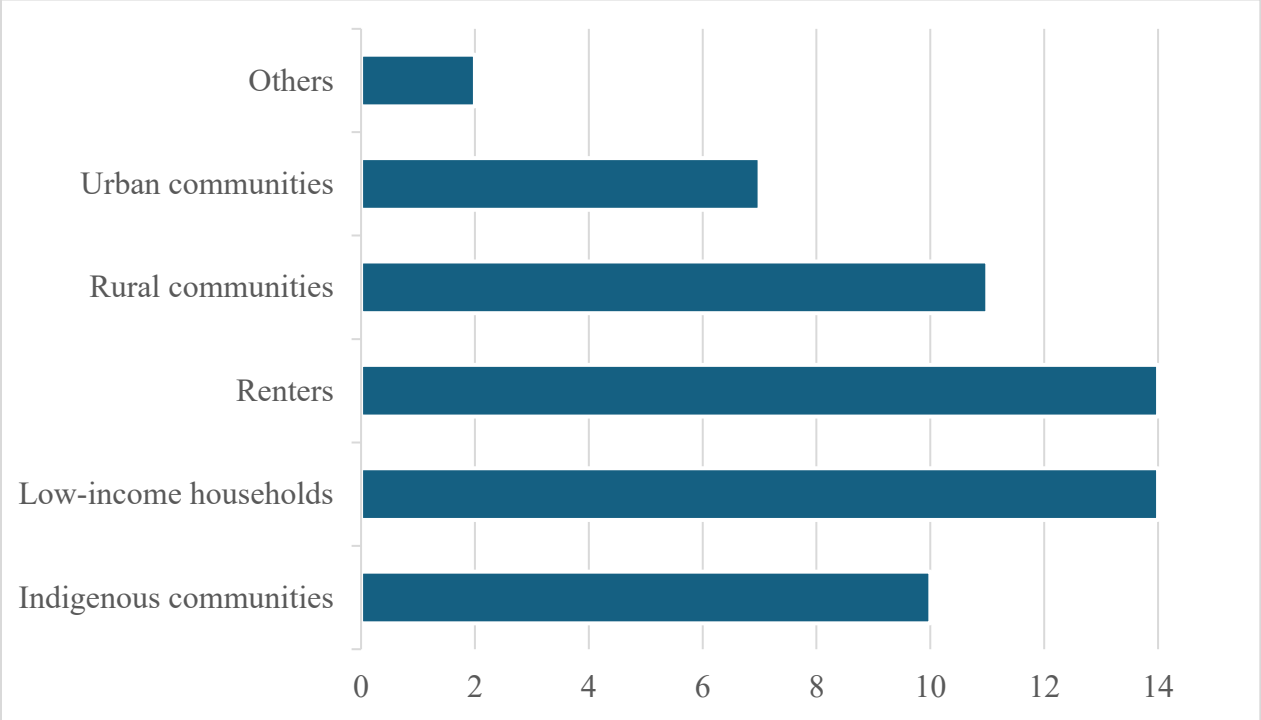


Figure 6: Participant-Identified Groups Most at Risk of Being Overlooked in Energy Planning and Decision-making

Low-income households were flagged by 13 participants across all expert groups as structurally excluded from many policy initiatives, burdened with higher pollution exposure, and often left out of incentive programs. Expert MX3 cautioned that "*The energy transition is often driven by well-intentioned experts, but their moral certainty can overlook the realities faced by low-income households,*" risking legitimacy and fairness.

Renters, identified by 13 participants, face additional invisibility due to their lack of control over living conditions and "*are typically excluded from the available programs and incentives that target residential energy efficiency,*" as stated by expert MX5. PR2 emphasized the affordability

gap, noting that large-scale retrofits and renewable adoption remain "beyond the means" of many renters.

For rural communities, perspectives diverged. PR3 argued that "*energy policy is too highly focused on low-income households because of affordability concerns, and on indigenous peoples because they have an active voice and strong Federal support,*" adding that "*There is no one advocating for those other groups (renters, rural and urban communities).*" In contrast, MX3 warned that "*many of the new things to be developed will be in rural communities*" and that it will be "*all too easy to steamroll developments*" ont them without adequate benefit-sharing, stressing that "a*ttention will be required to ensure they are treated appropriately and fairly.*"

Urban communities, mentioned by 7 participants, were described as key energy consumers facing governance challenges that restrict their ability to lead local transitions. PR3 noted that there is limited advocacy for urban groups in current energy policy discussions, leaving their specific needs and contributions largely unaddressed. MX3 noted that "*value at risk"* in cities but stressed that municipalities have "*so little say over their own energy destinies/their part in the broader energy destiny.*"

Beyond these recognized groups, several participants urged an expanded equity lens to include new immigrants, youth, and racialized renters. MX4 linked this to systemic marginalization "*across Canada,*" noting that these demographics are "*most likely to be overlooked or underserved*" not only in the energy sector but also in housing, environmental justice, and support programming, adding that while the energy sector can contribute to dismantling these injustices, "*they are not happening in a vacuum.*" PR3 emphasized that "*certain rate classes are unfairly burdened*" and argued that the energy transition must address the question of "*who pays,*" as current cost-recovery models "*overlook broader societal benefits*" and "*place unfair burdens on*

certain groups, including new entrants facing steep capital contributions," calling for a fair reassessment of the entire rate base.

Half of the participants (8 of 15) raised concerns that centralized nuclear and natural gas investments could exacerbate financial burdens for Indigenous, racialized, and low-income communities. SJ1 observed that "*nuclear energy has a disproportionate impact on Indigenous communities, while pollution from 'natural' gas plants tends to affect racialized communities more heavily,*" adding that "*the rising financial costs associated with continued or increased use of nuclear and 'natural' gas disproportionately burden lower-income populations.*" MX3 similarly criticized that projects "*continue to get 'rammed' into communities,*" where environmental and other groups face "*a labyrinth of procedural challenges*" and are often told "*interesting points, but this is not the right forum for those.*"

Table 6 provides an overview of expert perspectives on energy justice in Ontario, highlighting the key groups identified as most vulnerable in the transition. For each subtheme, the table lists the participants who explicitly mentioned it, making it clear which insights were shared broadly, and which were raised by specific experts.

Table 6: Summary of Expert Perspectives on Energy Justice in Ontario and Identified Vulnerable Groups in the Transition

Subtheme	Key Insight	Responses
Inclusive Governance & Indigenous Rights	Energy justice requires addressing historical harms, respecting FPIC, and promoting inclusive, participatory governance structures.	MX1, PR2, PR3
Climate Urgency & Ecological Boundaries	Ignoring climate science and planetary boundaries undermines energy justice and the viability of future transitions.	CE1, CE2, CL1, MX6

Systemic Power & Structural Injustice	Corporate control, elite policy-making, and outdated governance models hinder equitable reform and energy democracy.	CE2
Equity Barriers in Policy Design	Policy and program structures often exclude marginalized groups, limiting their capacity to benefit from or influence the transition.	PR2, MX5
Socioeconomic & Regional Disparities	Low-income, rural, renter, and urban communities face distinct and compounded barriers in accessing energy programs and infrastructure.	SJ1, MX2, PR2, PR3, MX5
Public Engagement & Tokenism	Public input is often treated as symbolic rather than substantive, especially in strategic-level energy planning.	PR2
Cost Burden & Grid Access Inequities	Inequitable energy costs and infrastructure decisions reinforce long-standing disparities in access and political voice.	PR3, CL1, MX6
Energy Justice as Sustainability	Justice is a core element of energy sustainability, which includes resilience, security, ecological integrity, and democratic governance.	CE2
Overlooked & Unrepresented Groups	Certain communities, particularly rural, racialized, and renters, remain invisible in policy and lack meaningful advocacy.	MX1, SJ1, PR1, CE2, MX2, PR2, PR3, MX3, MX4, MX5
Disconnection Between Needs & Programs	Existing energy programs are too narrowly focused and fail to serve broader community needs equitably.	PR1, MX2, PR3, MX3, MX4, MX5

Having outlined how different experts conceptualize energy justice and identified those most at risk, the next section explores the structural and systemic challenges that limit progress.

4.3.2 Transition Challenges & Setbacks

This section focuses on what participants identified as the main obstacles to Ontario's energy transition, grouped into structural and institutional barriers, technical and environmental constraints, and social justice and equity-related concerns. These challenges emerged from patterns

across participant responses, with some themes raised by a majority of respondents and others by only a few, reflecting both points of consensus and areas of divergence.

I. Structural and Institutional Barriers

- Political and Governance Challenges

A majority of participants identified deep-rooted political and institutional barriers as critical obstacles to Ontario's energy transition. MX1 stressed that "*the political will to enforce aggressive carbon reduction policies will be critical,*" warning that a lack of consensus on the pace and scale of renewable energy adoption could delay progress. CE2 echoed this, stating simply that "*there is no political consensus on the energy transition.*"

Several participants linked these challenges to public misinformation, particularly around renewables like wind and nuclear. CL1 argued for targeted communication campaigns to "*systematically expose and counter*" myths, adding that anti-corruption legislation is needed to prevent legislators from profiting from fossil fuel associations. One multi-sector expert (MX3) emphasized the overlooked potential of Local Distribution Companies (LDCs), noting their limited current role despite being "*tasked with delivering power*" and having the capacity to plan, own, and operate local energy systems.

- Economic and Financial Barriers

Economic and financial constraints were another widely shared concern, particularly for marginalized communities. MX1 noted that while the costs of solar and wind have decreased, "*significant upfront capital is still required,*" and existing subsidies often fail to reach low-income communities without the initial capital to participate. MX5 stressed that competing priorities between "*economic growth/efficiency and equity*" are a significant barrier and also highlighted the

absence of equity-specific data, which leads to one-size-fits-all policies. The same participant underscored the importance of investment, stating, "*It is critical to support full electrification, trade capacity, affordability, and public acceptance for the transition.*"

- Labor and Capacity Development

Only a few participants addressed labour concerns in depth, but those who did emphasized that the transition must protect fossil fuel workers through robust retraining and reskilling programs to ensure their livelihoods are protected. As MX1 noted, "*workers in these industries (fossil fuels) will need to transition to new jobs in renewable energy, energy efficiency, and electric vehicle infrastructure,*" which will require significant investment in training and job placement. MX3 linked workforce capacity to institutional agility, stressing that "*such considerations (development, security, and resilience) should never be taken for granted*" and warning that outdated regulatory systems must be streamlined to keep pace with transition demands. PR1 agreed, pointing to Ontario's recent expansion of demand-side management plans as "*a step in the right direction,*" but argued that they could "*still do more*" by increasing public transparency, broadening participation in planning, and conducting regular reviews of resource potential.

II. Technical and Environmental Constraints

- Infrastructure and Technological Limitations

Many participants agreed that technological constraints, particularly grid limitations, threaten the success and equity of Ontario's energy transition. MX1 pointed to "*the challenge [that] lies in integrating these variable energy sources efficiently into the grid,*" stressing that advances in energy storage and grid modernization will be crucial. PR3 argued that "*while utilities are often blamed, the government also bears responsibility,*" noting that the lack of action on electrification

infrastructure has left rising costs "*even more difficult to tackle.*" MX5 highlighted that rural communities face "*limited grid access*" and slower reconnection after storms, meaning they "*aren't prioritized during recovery efforts,*" which compounds existing inequities. CE2 framed the solution as a "*shift from Integrated Energy Resource Planning to Integrated Energy System Planning,*" describing it as a move from incremental change to "*a transformational change of our energy system.*" PR1 echoed this, emphasizing the need to "*increase electricity supply and improve grid flexibility*" while also maintaining affordability and, where possible, reducing greenhouse gas emissions.

- Environmental and Resource-Based Concerns

Respondents voiced significant concerns about the environmental and resource-related contradictions in Ontario's energy transition, stressing that ecological risks and fossil fuel expansion must be addressed together for a just and sustainable path forward. MX1 noted the delicate task of "*achieving net-zero emissions by 2050 while balancing the environmental impacts of new infrastructure,*" pointing to opposition from Indigenous groups and environmental activists to large-scale hydropower projects. Views on nuclear power were divided, but several participants, including MX1 and CE1, flagged cost overruns, delays, and environmental risks as undermining its viability, with CE1 warning that "*the energy promised will likely not be available to be of any use for the transition off of fossil fuels.*" RE1 raised safety concerns about "*potential nuclear disasters at the Pickering Site and other nuclear sites.*" Opposition also extended to Ontario's continued investment in gas plants, with CE1 arguing these expansions "*will make it impossible for Canada to keep within the Paris Accord agreements.*" MX2 added that "*high technological costs, economic risk aversion, limited benefits for low-income groups, political disinterest shaped*

by populism and narrow housing definitions, and environmental issues like land use and GHG emissions" particularly disadvantage marginalized communities.

III. Social Justice and Equity-Related Concerns

Across all sectors, participants emphasized that equity is not an add-on but a prerequisite for a successful energy transition. MX1 cautioned that "*rising energy costs, driven by the increasing share of renewable energy and inflation, could exacerbate energy poverty for low-income households,*" particularly in rural and Indigenous communities. PR2 warned that "*the pace of change is daunting*" and risks leaving more people behind if decisions do not transparently address energy justice issues.

Several participants linked the legitimacy of the transition to public education and meaningful participation. MX4 stressed the need to "*avoid the creation of winners and losers,*" calling for significant social and political investment to ensure a just transition. MX1 also highlighted a persistent disconnect between energy and housing policy, which often leaves renters unable to benefit from energy upgrades due to landlord control and fragmented regulations, noting that "*policies linking energy reforms to affordable housing development could help.*"

A recurring point, raised by MX1 and echoed by others, was the lack of disaggregated equity data, which makes it difficult to identify and address community-specific needs. As MX1 explained, "*Without detailed, community-level data on energy access, affordability, and usage patterns, it becomes challenging to identify and address the unique needs of different communities.*"

Table 7 summarizes the structural, technical, and social transition challenges highlighted by participants. For each subtheme, only the participants who explicitly mentioned it are listed,

making it clear which issues were raised broadly, and which were highlighted by specific participants.

Table 7: Summary of Transition Challenges & Setbacks

Subtheme	Key Insight	Responses
Policy Gaps & Political Will	Weak coordination, lack of political commitment, and fossil fuel misinformation undermine transition momentum.	MX1, CE2, RE1, CL1
Institutional Reform & Accountability	Calls for anti-corruption legislation and a proactive role for local utilities to ensure transparency and effectiveness.	MX3, CL1
Economic Barriers & Financial Inaccessibility	High upfront costs, limited capital for low-income groups, and lack of equity-focused data hinder inclusive participation.	MX1, RE1
Efficiency vs Equity Tradeoffs	Growth-oriented strategies often neglect social equity; a more balanced approach is needed.	RE1, MX6
Technological Integration & Grid Limitations	Fragmented planning and outdated infrastructure prevent renewable integration and responsive system design.	MX1, CE2, MX2
Environmental Conflicts & Land Use	Ecological impacts of renewables, nuclear risks, and hydro opposition challenge environmental and social goals.	MX1, CE1, RE1, MX2
Data Gaps & Equity Blind Spots	Insufficient disaggregated data limits equitable planning and masks community-specific needs.	MX1
Workforce Transition & Skills Gap	Transition requires green job reskilling, trade capacity, and institutional readiness.	MX1, MX3, MX5
Social Buy-In & Transition Legitimacy	Vulnerable groups may be left behind; equity and community trust are key to avoiding resistance.	PR2, MX4

In response to the challenges and systemic barriers identified, the next section explores the range of strategies and solutions offered by the participants aimed at embedding justice more meaningfully into Ontario's energy transition.

4.3.3 Solutions & Pathways Forward

Participants emphasized that in response to the diverse challenges facing Ontario's energy transition, meaningful progress will require not only the deployment of renewable technologies but also a reimagining of governance, equity frameworks, and social investment. While there was variation in emphasis, most participants agreed on four overarching categories of strategies: equity and inclusion, governance reform, renewable integration, and public engagement.

I. Equity, Inclusion, and Community Empowerment

Most respondents emphasized that equity and inclusion must be foundational to Ontario's energy transition, calling for intentional policies that address affordability, workforce access, environmental accountability, and long-term resilience for vulnerable populations. PR1 argued that *"lower income Ontarians are not as well placed to invest in electrifying their end-uses without adequate and properly structured support programs."* MX5 suggested "*integrating targeted training and apprenticeships into program design to ensure equitable access to jobs,"* while CE2 connected community engagement directly to equity outcomes, noting that *"when you engage communities, issues of equity are more central in decision making… energy democracy challenges corporate-dominated structures."*

A smaller but notable group warned that large-scale renewables risk replicating past injustices without strong environmental and social safeguards and highlighted the importance of resilience measures. They stressed that resilience must be built through decentralization, with PR2 arguing that *"decentralization of energy generation will ensure that generation is available where it is needed most to avoid costly transmission,"* and CE2 adding that *"standardization and mainstreaming of community energy and emissions planning"* should be paired with investments in thermal infrastructure and aligned building codes. Equity-focused retrofits were also

emphasized with MX5 insisted that *"it is critical to ensure that programs and policies designed are inclusive and include measures that improve the retrofit readiness of homes in the most dire need of retrofit."* At the same time, CE1 underscored that *"public transit and retrofit programs should be constructed to support vulnerable communities—disabled, poor and lower income."*

Several participants criticized current procurement practices as inequitable, highlighting the need for tailored, reparative frameworks that confront colonial legacies and racialized pollution impacts, stressing that true empowerment depends on inclusive planning and accessible communication that enable communities to envision and shape their energy futures. CL1 maintained that *"we already have most of the policy or procedures required. We just need fair procurement… and a government that has not tied itself to fossil fuel infrastructure and fossil fuel interests."* CE2 linked this to deeper historical injustices, pointing to *"intergenerational and intragenerational issues—like historic inequitable distribution of energy pollution and the colonial impact of our energy system."* For MX4, empowerment meant enabling communities to *"imagine what the energy system should look like for them,"* through resilience, sovereignty, and clear communication that ensures communities understand both the benefits and risks of proposed projects.

II. Policy, Planning, and Governance Reform

Respondents emphasized that a just and effective energy transition in Ontario requires deep structural reforms to policy, planning, and governance. They called for integrated, forward-looking planning that unites electricity, heating, transportation, and climate objectives, while centering community participation. MX3 argued that *"integrated planning should be implemented across all energy forms, not in silos as is currently done,"* and stressed the need to enhance opportunities for Indigenous participation through alignment of policy, regulation, and business. PR3 likewise

emphasized that the OEB and IESO must adopt a more forward-looking orientation, calling for *"anticipatory investments"* and a redefinition of *"need"* to reflect evolving risks rather than rigid certainty. Complementing these views, MX2 proposed that climate change be explicitly written into the mandates of both regulatory bodies, underscoring the importance of embedding justice and sustainability into institutional frameworks.

Concerns about weak political will and performative consultations were widespread. CE1 insisted that *"government needs to listen and act on the recommendations provided by experts and provide public consultation that actually takes feedback seriously."* Similarly, CL1 warned that *"we already have most of the policy or procedures required. We just need fair procurement… and a government that has not tied itself to fossil fuel infrastructure and fossil fuel interests."* For these participants, governance reform was not just about technical integration, but about disentangling energy policy from entrenched political and economic interests.

Labor justice emerged as a parallel theme, with several participants stressing that inclusive policymaking must prioritize equity in the workforce. SJ1 highlighted the importance of supporting a *"just transition in the labor force—workers moving from fossil fuel to renewable energy,"* while PR2 called for *"more imaginative programs… not only for renewable energy but also for conservation,"* particularly ones targeted at low-income households. Together, these responses reveal broad agreement that governance reform in Ontario must be anticipatory, equity-driven, and inclusive of both systemic and workforce considerations.

III. Renewable Integration and Infrastructure Development

Experts highlighted that Ontario's renewable energy transition requires not only rapid deployment of diverse clean energy sources but also systemic infrastructure modernization to ensure reliability, equity, and long-term resilience. MX1 advocated for a *"multifaceted*

approach… setting aggressive renewable energy targets, investing in renewable energy zones and grid infrastructure upgrades, modernizing and strengthening grid reliability, promoting electric vehicle adoption and charging infrastructure, [and] investing in small modular reactors." CE1 emphasized complementary strategies such as *"community energy systems, solar installations on parking lots, agrivoltaics, and offshore wind with storage."*

Electrification of transport was identified as essential, with participants calling for rural EV charging networks, purchase incentives, and vehicle-to-grid integration to turn EVs into stabilizing grid assets. MX1 called for stronger investment in "*microgrids and distributed generation to promote EV adoption,*" while MX5 urged prioritization of *"electrification in high-impact sectors, like transportation."* MX7 went further, emphasizing that *"cheap and efficient mass transportation"* offers one of the fastest pathways to decarbonization. Together, these responses underscore broad agreement that electrification is not only a technological imperative but also a central social strategy for advancing Ontario's transition.

Equity concerns were central throughout, with a policy and regulation expert warning that without inclusive design, low-income and Indigenous communities may face outdated infrastructure and climate vulnerabilities, highlighting the need for a regulatory shift toward anticipatory planning. PR3 warned that *"certain rate classes are unfairly burdened,"* pointing to outdated distribution and transmission codes currently under review, and further noted that renewable projects are often met with *"not in my backyard (NIMBY)"* resistance.

IV. Education, Collaboration, and Public Awareness

Participants underlined that education, collaboration, and public awareness are essential pillars of Ontario's energy transition, underscoring the need for inclusive, transparent engagement and cross-jurisdictional coordination. They highlighted that public education, especially around

complex technologies like nuclear, must be accessible, culturally sensitive, and tailored to marginalized communities to build trust and participation. SJ1 urged the government to *"subsidize and highly promote training in renewable and climate-friendly energy"* to support workers transitioning out of fossil fuels, while MX5 stressed the *"need for access to new green jobs for underrepresented and underserved folks."* MX2 pointed to persistent education gaps in partnering with Indigenous groups, noting that *"it's rare to partner with Indigenous groups,"* framing this as partly an education issue that must be addressed to foster stronger and more meaningful collaboration. Together, these perspectives highlighted the role of culturally inclusive training programs in ensuring equitable workforce access.

Inter-provincial collaboration was also proposed as a strategic step toward grid stability and decarbonization. There was also emphasis on the importance of clearly communicating the practical benefits of renewables to foster public support and counter misinformation. CE1 called for Ontario to *"focus immediately on renewable energy sources… and purchase hydro power from Quebec,"* while MX7 similarly stressed the need to *"build the infrastructure to get Quebec power to the GTA."* PR3 reinforced this by underscoring that *"renewable energy brings down the cost of electricity and increases reliability and flexibility of the grid,"* but cautioned that this requires better system visibility to optimize deployment. Together, these perspectives situate collaboration and cross-jurisdictional planning as essential to both grid stability and public confidence in the transition.

As shown in Table 8, participants offered a range of policy, institutional, and community-based strategies to address the barriers identified earlier in the transition process. For each subtheme, only the participants who explicitly mentioned it are listed, making it clear which issues were raised broadly, and which were highlighted by specific participants.

Table 8: Summary of Transition Solutions and Pathways Forward

Subtheme	Key Insight	Responses
Equitable Access and Energy Affordability	Low-income and marginalized households require structured, accessible programs to afford and benefit from clean energy transitions.	MX1, PR1, MX5
Just Transition and Workforce Equity	Reskilling programs must prioritize fossil fuel workers and expand pathways to green jobs for all communities.	MX1, SJ1, CE2, RE1, MX5
Community Ownership and Empowerment	Inclusive planning and support for community-owned energy systems foster energy democracy and local resilience.	CE2, RE1, PR2, MX4, MX6
Indigenous Rights and Energy Sovereignty	Indigenous leadership, FPIC, and equitable procurement are essential for a just transition on Indigenous lands.	MX1, CE2, PR2, MX4, CL1
Integrated and Inclusive Policy Reform	Governance must coordinate across sectors and embed climate and justice mandates in regulatory frameworks.	CE1, MX2, PR2, PR2, MX3, CL1
Renewable Expansion, Electrification, and Grid Modernization	Ontario should adopt binding renewable targets and invest in smart grids, microgrids, and rural/remote grid access.	MX1, CE1, PR3, MX5
Education, Engagement, and Energy Literacy	Culturally inclusive education, public consultations, and interprovincial energy cooperation are key to trust and awareness.	MX1, PR3, MX7
Forward-Looking and Adaptive Infrastructure Planning	Energy policies should adopt risk-tolerant, anticipatory planning beyond outdated definitions of need.	PR3, MX6

While this previous section outlined the broader contextual landscape of Ontario's energy transition, the following section examines how equity considerations are, or are not, integrated into energy policy and governance frameworks.

4.4 Equity in Energy Policy

This section zooms in on how equity is addressed, or not addressed, in current policies and planning processes. A majority of the participants agreed with the need to evaluate Ontario's energy policies through an energy justice lens.

4.4.1 Energy Justice Tenets

Respondents highlighted that energy justice is multidimensional and encompasses a range of concerns related to fairness in energy systems. In this section, participant responses are presented in relation to four energy justice tenets (distributive, procedural, recognition, and restorative justice), which were used to guide the structure of the survey. These categories, drawn from existing literature (Jenkins et al., 2016; Sovacool et al., 2020; Wyse et al., 2021) served as a framework for eliciting expert reflections on how equity considerations are, or are not, addressed in Ontario's energy transition.

I. Distributive Justice

In response to questions about distributive justice, participants emphasized that ensuring a fair distribution of benefits and burdens must be an intentional and structural element of Ontario's energy transition. A majority (10 of 15 participants) stressed that historically marginalized communities must receive a fairer share of the benefits, while being protected from disproportionate harms.

For example, MX1 argued that Ontario's energy policies should **"***prioritize the benefits and burdens of the transition, focusing on Indigenous and low-income communities,***"** with measures such as green jobs, renewable energy projects, reinvestment of carbon revenues, and retraining for fossil fuel workers to ensure no one is left behind. PR1 similarly urged expanding **"***income-*

targeted program offerings to deliver no-cost, turnkey solutions" to affected households. CE1 went further, insisting that governments must "*make polluters pay and stop promoting and subsidizing the fossil fuel industry,*" including using regulatory tools to make energy-efficient appliances and technologies more affordable. At the same time, PR2 acknowledged that while distributive justice is increasingly discussed in theory, "*I really only hear these concepts at conferences with guest speakers. I don't hear it in day-to-day discussions on energy policy,*" highlighting a persistent gap between rhetoric and practice.

Several participants also linked distributive justice to redressing past harms. MX4 emphasized the need for more community energy projects, improved environmental regulations, and remediation strategies, while CE2 advocated community-led emissions planning to better reflect local priorities. CL1 underscored that "*places currently most harmed by dirty energy*" should be first in line for renewables, and SJ1 argued that equity requires choosing energy options that "*protect the climate, the environment and are cheapest, i.e. improved efficiency and transition to renewables.*" Taken together, these perspectives highlight a convergence that distributive justice in Ontario must be both forward-looking, ensuring affordability and inclusion in new investments, and reparative, by directly addressing historical inequities and environmental harms.

II. Procedural Justice

While participants were specifically asked about procedural justice, many went beyond simply answering the question to stress its foundational role in a just energy transition. They emphasized that fair, inclusive, and transparent decision-making is essential to a fair energy transition in Ontario, calling for decision-making that genuinely empowers marginalized communities. Twelve respondents raised concerns about Ontario's current consultation practices, describing them as inaccessible, tokenistic, or skewed toward corporate interests.

MX1 stressed the importance of **"***transparent, inclusive, and accountable decision-making processes,***"** particularly early and meaningful Indigenous participation, with decision-makers clearly explaining how public input shapes outcomes. RE1 argued that OEB rules must be restructured to **"***favor communities instead of large nuclear and fossil fuel conglomerates.***"** MX2 warned of Enbridge's outsized lobbying influence, calling for clearer insight into private sector access to policymakers. MX5 added that procedural justice requires more than volunteer calls, noting that vulnerable groups face barriers such as childcare responsibilities and accessibility that limit their participation.

Participants also pointed to broader structural reforms. CE2 urged empowering communities through local energy and emissions planning to build capacity from the ground up. MX3 observed that "*while regulatory review processes for Ontario's rate-regulated utilities are improving, including Indigenous participation, broader public input into upstream policy decisions, like integrated planning, remains limited,*" leaving communities unable to shape fundamental priorities. CE1 linked procedural fairness to resisting fossil fuel misinformation and ensuring climate integrity, warning that "*without media accountability and public awareness, climate denialism will continue to influence elections and undermine fair decision-making*."

Altogether, these perspectives reveal a broad consensus that current processes lack legitimacy, though participants differed on whether reform should begin with institutional redesign (OEB/IESO), transparency mechanisms (anti-lobbying), or community capacity-buildingto enable fuller, more inclusive participation.

III. Recognition Justice

On recognition justice, participants emphasized that acknowledging and respecting diverse identities is not just symbolic but requires structural change. Eight participants highlighted

Indigenous sovereignty as essential. MX1 argued that Ontario's policies must **"***respect Indigenous communities, ensure their Free, Prior, and Informed Consent, and be culturally sensitive,***"** while MX4 pointed to emerging energy sovereignty movements and called for a **"***larger and more diverse decision-making table***"** to expand visibility and understanding of problems.

Inclusion extended beyond Indigenous communities. MX5 called for **"***culturally responsive community engagement with diverse knowledge systems,***"** while CE1 proposed "*incentives for developers to build high-performance rental housing with community energy systems, and support co-ops, NGOs, and non-market housing providers to do the same for affordable housing. Additionally, electrified public transit should be free or income-scaled for low-income users***."** PR1 framed recognition justice in terms of "*ensuring engaging identity-based communities*" whose energy use patterns differ, and CE2 emphasized the role of "*community energy and emissions planning***"** in aligning policy with local realities. MX3 added that recognition also requires procedural reform, urging that "*one-stop review mechanisms, would help the public navigate what are currently complex and confusing procedures*."

Here, perspectives converged on the principle that Ontario's policies often overlook diversity in needs and identities. Where they diverged was in emphasis: some participants focused on Indigenous rights and energy sovereignty, while others highlighted the lived realities of renters, immigrants, and co-op models that remain marginalized under current frameworks.

IV. Restorative Justice

When reflecting on restorative justice, participants argued that Ontario must move beyond symbolic acknowledgment to tangible reparations and systemic transformation. MX1 stressed the need to **"***acknowledge past injustices, offer reparations, empower communities, and establish*

long-term partnerships" to ensure long-term equity, while SJ1 called for "*compensation of indigenous and other communities impacted by pollution from gas plants/ nuclear waste.*"

Several participants critiqued ongoing fossil fuel and nuclear investments as perpetuating past harms. CE1 warned that "*continuing to retrofit aging nuclear plants is costly, risky, and unnecessary,*" describing these projects as reinforcing past injustices, and advocated instead for renewables paired with modern storage solutions. MX4 similarly emphasized "*Investing in environmental protection and remediation projects where harm was done, supporting the energy sovereignty movements among Indigenous communities, providing jobs in the green energy sector in communities that used to be (or still are) reliant on mining and extractive energy projects.*"

A recurring theme was empowerment through community-led solutions. CE2 framed restorative justice as "*promoting community energy and emissions planning… promoting energy democracy,*" while CL1 argued that "communities most impacted by past policies should be first in line for remediation and job training." MX7 added that restorative justice must also include new participatory structures, suggesting an "*inclusive body to make public recommendations on proposals is one opportunity."*

Together, these accounts demonstrate that restorative justice is understood not only as repairing historical harm but also as creating lasting structures of community control, ensuring that those most affected by past policies lead Ontario's energy future.

Table 9 provides an overview of expert perspectives on the four energy justice tenets, indicating which participants explicitly raised each tenet in their responses. This ensures clarity that not all participants commented on every tenet, but those listed directly engaged with the subtheme.

Table 9: Summary of Expert Perspectives on the Energy Justice Tenets

Energy Justice Tenet	Key Insight	Responses
Distributive Justice	Ensure fair distribution of energy benefits and burdens through targeted investments, subsidies for low-income groups, prioritization of renewables, and reinvestment of carbon revenues in marginalized communities.	MX1, CE1, CE2, MX2, PR2, PR3, MX4, MX6, CL1
Procedural Justice	Improve participation, accountability, and representation in decision-making, ensuring accessible engagement, Indigenous sovereignty, and transparency in regulatory processes.	MX1, CE1, RE1, MX3, PR2, PR3, MX4, MX5, MX6, MX7
Recognition Justice	Address historical injustices by recognizing diverse identities, respecting Indigenous rights, ensuring culturally responsive engagement, and aligning policies with community realities.	MX1, CE1, PR1, CE2, MX3, MX4, MX5, CL1
Restorative Justice	Pursue healing and repair through reparations, environmental restoration, long-term co-governance, public education, and community empowerment.	MX1, CE1, SJ1, CE2, MX2, PR3, MX3, MX4, MX5, CL1, MX7

Having outlined the core tenets of energy justice, the next section examines how these principles are reflected in practice, with a particular focus on the extent and quality of community inclusion in Ontario's energy decision-making processes.

4.4.2 Community Inclusion

Community inclusion emerged as a critical pillar of Ontario's energy transition, with experts emphasizing that meaningful engagement of local communities, particularly those directly affected by energy projects, is essential for both justice and effectiveness. Several experts underscored that early involvement fosters trust, aligns projects with local values, and reduces resistance. As MX1 explained, *"early engagement of local communities in renewable energy projects ensures alignment with their needs, builds trust, and improves outcomes… [it] promotes equity by allowing communities to influence decisions and share in the economic and environmental benefits."*

Similarly, MX5 emphasized that *"including community perspectives is pivotal in understanding needs, empowering communities and maximizing impact of decisions,"* while SJ1 described inclusion as *"essential to maximize acceptance"* so long as accurate information is provided.

At the same time, experts cautioned that true inclusion requires addressing structural barriers related to access, capacity, and geographic diversity. PR1 supported inclusion in principle but added the caveat that *"local communities may not have the tools, information, or expertise to fully engage with important issues."* MX3 stressed the fairness dimension, noting that inclusion is *"extremely important for siting and making sure that some communities don't unduly take on more burden than others."* For PR2, Ontario's scale makes uniform approaches unworkable: *"Ontario is a big province, so a one-size-fits-all approach may not work. Grassroots perspectives are important."*

Looking beyond conventional consultation, several participants argued that deliberative and decentralized models could more meaningfully redistribute decision-making power. CE1 proposed that *"citizens' assemblies would be ideal—beginning with evidence from experts to permit citizens to make informed decisions."* MX2 linked inclusion to structural reform, describing *"decentralized energy as the future—especially for communities that own their own utilities."* For CE2, this shift was part of a broader movement toward *"energy democracy [that] challenges corporate-dominated structures in energy systems to reimagine social relations in energy systems and their beneficiaries."*

Collectively, these accounts reveal strong convergence around the principle that inclusion is not only ethical but a prerequisite for a just energy transition. However, divergence emerged around the mechanisms: while some emphasized education and information provision to enable

participation, others stressed structural reforms such as decentralization, community ownership, or citizens' assemblies.

Table 10 summarizes which participants explicitly mentioned these different dimensions of community inclusion. Building on the discussion of community inclusion, the following section assesses the current state of equity within Ontario's energy policy landscape, highlighting gaps between stated commitments to justice and their implementation in practice.

4.4.3 Current State of Equity in Policy

Respondents offered a critical view of Ontario's current energy policy, emphasizing that while some progress has been made, equity remains largely peripheral to policy design and implementation. Equity is insufficiently embedded in the system. As MX1 summarized, "Ontario's energy policies lack adequate equity considerations, with major gaps in affordability, Indigenous participation, workforce transition, and environmental justice." Existing programs were described as limited and short-term, with few systemic solutions in place to address inequities. A stronger just transition framework, participants argued, must prioritize vulnerable communities through equitable rate structures and sustained worker retraining.

Several participants underscored that Ontario's planning processes remain centralized and siloed, privileging integrated resource planning over truly integrated energy system planning. CE2 stressed that the province continues to rely on "centralized, top-down" approaches with "a lack of authentic community engagement," which undermines both efficiency and legitimacy. Others were even more pointed, with CL1 doubting that equity considerations are "considered at all," pointing to Ontario's "complete allegiance to old, dirty technology."

Environmental injustice was another recurring theme. Participants described how infrastructure neglect and energy siting decisions disproportionately affect low-income and racialized communities. CE1 warned that the cancellation of renewable projects and the expansion of gas infrastructure "has led to increased emissions, financial waste, and public health risks—such as higher rates of asthma, cardiovascular and respiratory illnesses." These harms, CE1 argued, are compounded by policies that "prioritize highways over public transit and sprawl over urban intensification," while shifting long-term gas costs onto ratepayers. RE1 added that equity remains "very poorly considered" as Ontario continues to favor large-scale nuclear development.

As illustrated in Table 10, participants raised concerns about the limited inclusion of communities in energy decision-making processes and the uneven integration of equity principles in existing policy frameworks. While Table 10 captures the subthemes, Figure 7 complements these insights by visualizing the gap between how important participants rated community inclusion and how well they believed equity is currently embedded in Ontario's energy policy.

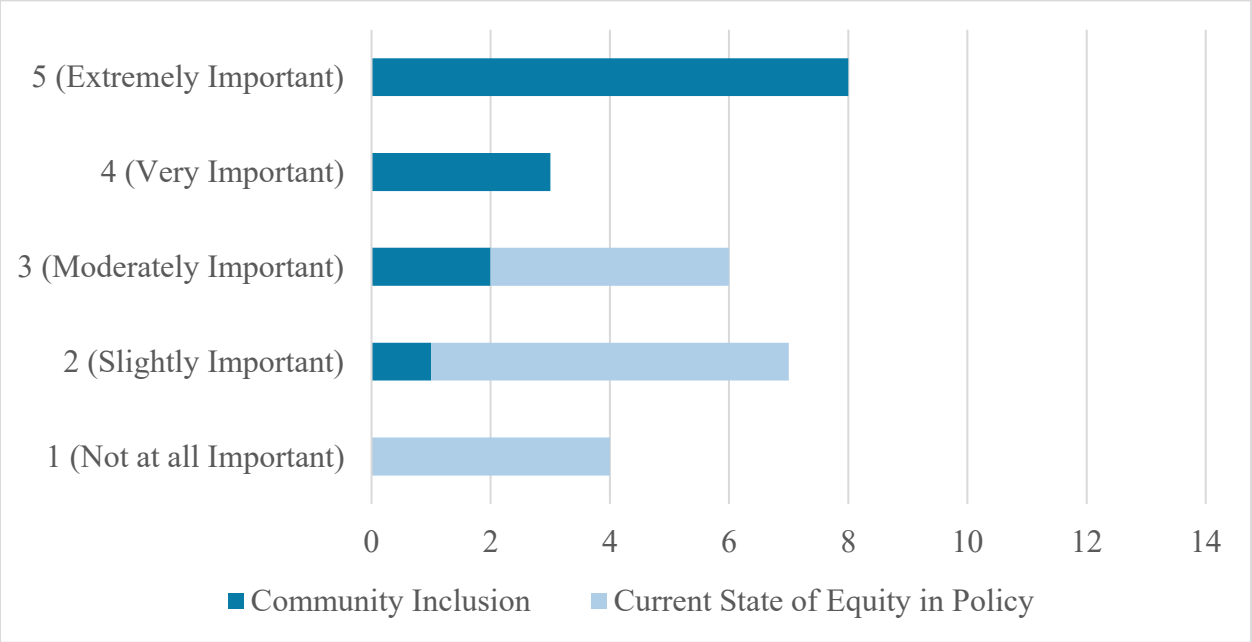


Figure 7: Participant Ratings of Community Inclusion and the Current State of Equity in Policy

Table 10: Summary of Expert Perspectives on Community Inclusion and Equity in Policy

Subtheme	Key Insight	Responses
Inclusive and Meaningful Engagement	Effective engagement requires early, inclusive consultation that builds legitimacy, avoids conflict, and reflects local knowledge.	MX1, CE1, SJ1, PR1, CE2, MX4, MX5
Capacity and Structural Barriers	Communities face limitations due to lack of tools, expertise, and influence, reinforcing top-down planning and limiting participation.	MX1, SJ1, PR1, CE2, MX5, MX6
Equity and Local Responsiveness	Energy policy must move beyond one-size-fits-all solutions and embed equity structurally to reflect diverse community needs.	MX1, CE2, MX2, MX4
Economic and Environmental Justice	Inclusive energy strategies ensure access to local benefits and address systemic infrastructure and environmental disparities.	MX1, MX2, PR3, MX4, MX6
Indigenous Rights and Participation	Systemic inclusion of Indigenous communities and co-governance remains limited despite some policy progress.	MX1, MX3
Public Trust and Governance	Political and financial motives often shape energy policy, undermining transparency, public interest, and trust.	CE1, SJ1, PR1, CE2

Participants highlighted significant gaps in existing energy policies, particularly around justice tenets, community inclusion, and governance. The following section explores these indicators and their potential for operationalizing energy justice in practice.

4.5 Operationalizing Equity: Indicators and Applications

This section moves from critique to concrete tools on how equity can be measured and implemented in practice. Participants validated existing indicators like affordability, availability, information, and involvement, but also proposed additional indicators. While participants were explicitly asked to share their views on the existing indicators, many also raised these themes organically in response to other questions, underscoring their perceived relevance across multiple

aspects of the energy transition. There was strong alignment among participants that new criteria must account for socio-economic and geographic diversity in energy access and burden.

4.5.1 Existing Indicators

I. Affordability

Affordability emerged as a fundamental pillar of energy justice, with participants underscoring its moral, social, and structural significance. They described unaffordable energy as a direct threat to dignity and well-being, forcing vulnerable households to choose between essentials like heat and food. Participants stressed that affordability is not merely about price but about equitable access and participation in the energy system, framing it as a gateway to broader justice goals. There was strong support for progressive, income-based pricing models and targeted government interventions that protect low-income groups from disproportionate costs.

Participants also emphasized that unaffordable energy forces vulnerable households to make trade-offs between essentials like heat and food. MX1 stressed that "*affordability is crucial for energy justice, as it directly impacts daily energy access for low-income and vulnerable communities,*" arguing for subsidies and discounted rates as part of a just policy approach. Others emphasized equity in distribution, with PR2 noting that "*affordability needs to be better defined… it means different things to different people,*" while MX3 clarified that "*Affordability will depend on who we're talking about - millionaires can afford things that a low-income earner cannot. I think the key here is equity and the progressive burden of costs.*" Several experts connected affordability directly to the energy mix, with CL1 insisting that "*clean renewables are cheap and getting cheaper. Fossil fuel energy is not affordable by all. Why disadvantage some members of our community by providing something they cannot afford?*" Together, these perspectives situate affordability as a gateway indicator for broader justice goals.

II. Availability

Participants consistently identified energy availability, defined as access to sufficient, reliable, and clean energy, as another foundational component of energy justice, particularly for rural, Indigenous, and northern communities that remain underserved. MX1 argued that "inequalities in economic opportunities, education, health, and well-being can be perpetuated by unavailability of renewable energy options," underscoring that universal availability is necessary for inclusion. CE1 pointed to northern realities where "*communities lack infrastructure for LNG and use diesel, propane, wood,*" though he noted promising Indigenous-led solar and wind initiatives. For CL1, the inequity was stark: "*clean, cheap energy should be a given for any resident of Canada. It is unfair that some people live in dirty communities, especially when it harms their health.*" MX3 connected the issue to history, reminding that "*throughout history, the use of energy has been closely tied to many of civilization's most important indicators of health, prosperity, etc.*" Across responses, availability was thus framed not just as technical capacity but as a determinant of well-being and citizenship.

III. Information

Participants consistently framed information as a foundational enabler of energy justice, emphasizing that transparency, accessibility, and cultural sensitivity are essential for empowering communities, building trust, and ensuring equitable participation in Ontario's energy transition. For MX1, "*energy justice depends on delivering clear, accessible information to marginalized communities,*" with culturally sensitive communication seen as essential to inclusion and trust-building. MX4 echoed this, stressing that "*the key is ACCESSIBLE information through science communication and knowledge mobilization to make sure it's understandable.*" Several participants warned that without purposeful communication, communities would be excluded from

opportunities. PR3 noted that "*customers have choice and need to have information regarding electrification, conservation, about how much their bill will go up,*" while MX7 was more blunt, stating "*if you don't know what programs are available you will miss out.*" At the same time, MX3 cautioned against information overload, explaining that "t*here can be too much information… but indicators are essential for situational awareness and for knowing whether we're heading in the right direction.*" Others tied information directly to empowerment, with CE1 pointed to the success of active transportation campaigns that shifted public demand, while CL1 argued that "the people closest to the effects of a decision should be making the decision," which requires informed consultation. Together, these insights position information not as an afterthought but as the connective tissue of equity.

IV. Involvement

Finally, involvement was also identified as a core pillar of energy justice, emphasizing that equitable participation, particularly of Indigenous, low-income, and marginalized communities, must be built into the design, governance, and implementation of Ontario's energy systems. MX1 emphasized that "*energy justice requires including marginalized, low-income, and Indigenous communities in decision-making,*" with Indigenous knowledge seen as key to fairness and sustainability. Yet participants also recognized practical constraints, with PR1 arguing, "*I don't think justice necessitates involvement in energy system policy from all impacted,*" while PR2 added, "*participation is important but we need to be realistic about who has the resources to participate.*" Despite these caveats, most stressed that involvement must be supported through structural reforms and capacity-building. CE2 argued that "*the system should be designed to benefit communities and the people who live in them,*" while MX3 reinforced that "*energy is a societal exercise, not just a technocratic or commercial one… it requires conversations across*

society." PR3 added that "*customers should always be able to communicate their wants, needs, etc.,*" reflecting the need for institutional mechanisms to translate involvement into influence.

Table 11 presents a summary of participant perspectives on the existing energy justice indicators and their relevance to Ontario's energy transition. Figure 8 complements this by visualizing how participants rated the importance of four key indicators revealing a strong consensus on their continued relevance, while also highlighting areas where current approaches may be falling short.

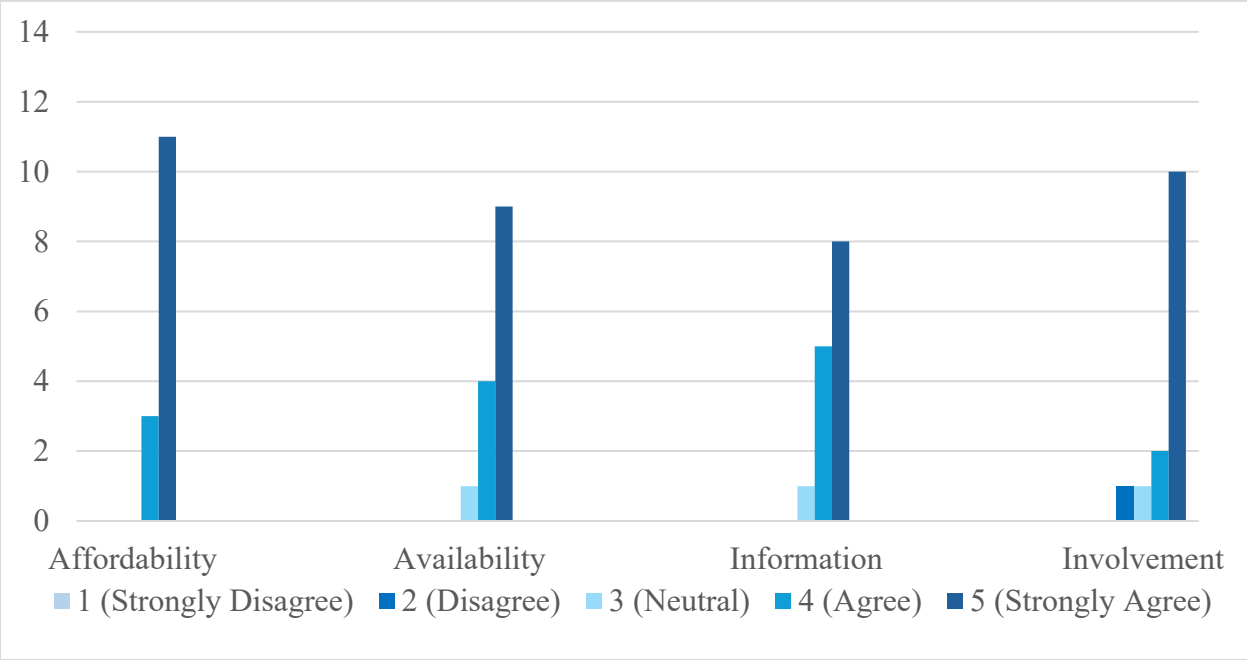


Figure 8: Expert Perceptions of Equity Indicator Relevance

Table 11: Summary of Expert Perspectives on Existing Energy Justice Indicators

Existing Indicators	Key Insight	Responses
Affordability	Affordability is central to energy justice, impacting access, equity, and well-being. Programs must equitably distribute costs, provide targeted support, and treat affordability as a foundational condition of justice.	MX1, CE1, SJ1, CE2, PR2, MX3, CL1, MX7

Availability	Reliable and equitable energy access is essential for societal health, development, and environmental justice. Rural, Indigenous, and underserved regions require infrastructure investment and distributed energy solutions.	MX1, CE1, SJ1, MX3, CL1
Information	Accessible, transparent, and culturally sensitive information empowers communities, builds trust, and enables meaningful participation. Governments must play a proactive role in awareness and communication.	MX1, CE1, PR2, PR3, MX3, MX4, CL1, MX7
Involvement	Equitable involvement means more than consultation, it requires influence, representation, and community empowerment. Systems must reflect local knowledge, address barriers to participation, and ensure inclusive governance.	MX1, CE1, PR1, CE2, PR2, PR3, MX3, MX4, CL1, MX7

Building on their reflections on the four existing indicators, participants also proposed additional measures they felt were necessary to more fully capture the complexities of energy justice in Ontario's transition. The next section outlines these proposed indicators.

4.5.2 Proposed Indicators

As shown in Table 12, participants articulated a wide range of interconnected indicators to evaluate energy justice in Ontario. These indicators span economic, environmental, social, and governance dimensions, reflecting a holistic vision of equitable energy transition. Participants often described the indicators in different ways, so similar responses were grouped and labeled to provide a clearer, consolidated picture of the proposed measures. The 'Responses' column lists all participants who explicitly mentioned or referred to aspects related to each indicator.

Table 12: Indicators Proposed by Experts

Proposed Indicators	Indicator Description	Responses
1. Affordability & Economic Burdens	• Ratio of energy costs to household income • Metrics of energy poverty • Economic accessibility for low-income groups • % of energy mix that is renewable	MX1, SJ1, PR1, CE2, RE1, MX2, PR2, PR3,

2. Renewable Energy Development & Access 3. Security & Reliability	• Local access to renewables (e.g., community solar) • Grid reliability metrics • Geographic and income-based accessibility gaps	MX3, MX6, CL1, MX7
4. Community Participation & Representation 5. Equity & Just Transitions	• Degree of community consultation and control in energy projects • Representation of marginalized groups in governance • Culturally respectful and accessible engagement practices • Use of equity scorecards (e.g., tracking race, gender, income in green job access) •Workforce retraining and support policies for fossil fuel-dependent regions	MX1, CE1, SJ1, CE2, RE1, MX4, MX5, CL1
6. Environmental Sustainability 7. Health and Well-Being	• Air pollution exposure levels, especially from fossil fuels • Climate impact assessments • Local ecosystem degradation or cleanliness • Incidence of respiratory or chronic illness • Self-reported environmental health and well-being	MX1, CE1, SJ1, MX4, MX6, CL1
8. Social Inclusion and Vulnerability	• Energy access disparities among newcomers, unhoused populations, and socially stigmatized groups • Program reach and inclusivity by demographic breakdowns	MX1, CE1, PR2, MX3, MX4, MX5

Having identified both existing and proposed indicators, the following section examines how participants envisioned these measures being applied in practice to advance equity within Ontario's energy planning and decision-making processes.

4.5.3 Application of Indicators

Despite agreement on the importance of equity indicators, many respondents were skeptical of their current application in Ontario's energy policies. As seen in the sections before, they described limited follow-through in implementation and insufficient resources devoted to enforcement or

measurement. Respondents criticized the lack of enforcement, resources, and integration, calling for indicators to be institutionalized through regular data collection, impact assessments, and transparent governance processes. As MX1 argued, applying energy justice "*requires data on access, impacts, and jobs, along with regular engagement with marginalized communities,*" including equity impact assessments and targeted support for vulnerable groups. MX5 added that "*Incorporating restorative justice through remediation programs for affected communities addresses past harms. Lastly, establishing feedback mechanisms allows for continuous evaluation and adjustment of policies to ensure equity and fairness throughout the energy transition.*"

Participants repeatedly called for embedding equity metrics into long-term, cross-sectoral energy system planning. CE2 stressed that "*energy planning should adopt an integrated systems approach that embeds equity metrics,*" while CE1 emphasized that "*every decision made across all sectors of government should be made with a climate lens and with the Indigenous wisdom of considering the well-being of the next seven generations*." PR2 further warned that equity remains absent in practice, arguing that it "*has to be made a priority… transparent and clear with definitions that are understood, and articulated through objectives or criteria in government consultation documents.*"

A key step, participants argued, is moving from symbolic commitment to operational justice by institutionalizing clear definitions and binding targets. PR1 proposed that "*the provincial government could enshrine in policy or regulation a clear definition of energy poverty and set targets for reducing it,"* while MX5 called for "*mandatory impact assessments that include equity metrics*" alongside greater transparency in decision-making.

Finally, several respondents highlighted the role of community-based research and participatory policymaking in shaping responsive, data-driven equity goals. MX4 pointed to

surveys, interviews, and engagement activities as crucial to capturing lived realities, while MX3 suggested that indicators "*can be developed through participatory processes, then made public for transparency purposes and… governance/management/performance assessment and comparison/benchmarking purposes.*"

As shown in Table 13, participants offered practical strategies for moving beyond rhetorical commitments to the institutionalization of equity indicators through definitions, enforcement, data collection, and participatory governance.

Table 13: Summary of Indicator Applications Proposed by the Experts

Proposed Application	Indicator Description	Responses
Equity Monitoring and Transparency	Policies should be continually evaluated for equity impacts, with transparent and assessable governance structures to ensure accountability.	MX1, PR1, MX3, MX5
Integrated and Inclusive Planning	Energy planning should be cross-sectoral, incorporate justice considerations, and engage communities in co-development processes.	MX1, CE2, MX4, MX6, CL1
Climate and Environmental Justice	All decisions must apply a climate lens, respect Indigenous wisdom, and use localized data to advance environmental equity.	CE1, SJ1, MX4, MX6, CL1
Social Equity and Restorative Action	Policies must address historical burdens through fair distribution, legal recognition of energy poverty, and restorative justice programs.	MX1, PR1, PR3, CL1
Labor and Just Transition	Equity frameworks must include targeted support for fossil fuel workers transitioning to clean energy sectors.	SJ1, CL1
Long-Term Sustainability Vision	Governance should incorporate long-term, intergenerational thinking rooted in Indigenous teachings like the 'seven generations' principle.	CE1

These findings not only highlight critical shortcomings but also outline actionable frameworks. The following discussion interprets their significance for Ontario's energy future, drawing out their implications for policy, planning, and governance.

Chapter 5: Discussion

The discussion section delves deeper into the key findings and themes presented in the results chapter, offering interpretation and critical analysis of their significance. By emphasizing equity and justice as key evaluative lenses, this chapter provides a critical reflection on Ontario's energy sector transition. The discussion engages directly with the study's overarching research question and objectives by examining how equity considerations are currently understood, assessed, and incorporated into energy decision-making processes, and by evaluating the effectiveness of existing policies in advancing more inclusive outcomes. It argues that while equity is increasingly acknowledged, it remains peripheral in practice, often limited by structural, political, and procedural barriers that must be addressed through systemic reform and community-driven governance. The chapter proceeds by first examining how participant backgrounds shaped their interpretations of justice, followed by a thematic analysis through the four energy justice tenets, an evaluation of policy gaps, a critique of existing indicators, and finally a synthesis of contributions to theory and practice.

5.1 Varied Justice Perspectives Across Professional, Experiential, and Gender Lines

Before turning to the thematic analysis of the findings, this section explores how participant perspectives on justice were shaped by their professional backgrounds, experience levels, and gender. While there was broad agreement across the sample about the need to embed equity into Ontario's energy transition, the rationale and emphasis varied significantly. Unlike the following sections, which focus on thematic insights drawn directly from participant responses, this section synthesizes patterns across subgroups of experts, revealing how demographic and occupational positionalities influence the interpretation and prioritization of justice. This additional layer of analysis advances the central argument of the chapter by showing that while equity is a shared

concern, its operationalization is not uniform as justice is understood and enacted differently depending on one's institutional role, lived experience, and lens of engagement. Recognizing these distinctions strengthens the call for equity frameworks that are not only comprehensive but also flexible enough to reflect the diversity of actors shaping Ontario's energy transition.

A closer examination of participant demographics reveals notable patterns in how energy justice themes were prioritized, shaped by professional background, years of experience and gender. Participants with expertise in community engagement and social justice, many of whom had 10-20+ years of experience, consistently emphasized the importance of involvement and procedural justice. In contrast, those working on the front lines of energy access and affordability, including participants from municipal agencies and non-profits, prioritized affordability, and equitable infrastructure access. These respondents often framed affordability not merely as a technical issue and economic metric, but as a matter of dignity, particularly for renters, Indigenous communities, and low-income households in rural or remote areas. Meanwhile, participants with a primary focus on renewable energy engineering, transmission, or energy regulation, typically with 15 or more years of experience, focused more heavily on themes like policy gaps, infrastructure modernization, grid reliability, and renewable energy integration. Their insights reflected long-term system reliability and technical feasibility but showed less emphasis on participatory or procedural aspects of justice. Despite this divergence, equity remained a unifying concern across all roles; what differed were the rationales. Community practitioners grounded their arguments in moral and historical justice, technical experts emphasized system reliability, cost-efficiency, and user acceptability, while policymakers framed it in terms of integration into regulatory design and planning coherence (e.g., aligning housing and energy policy).

Experience levels also shaped perspectives. Senior participants (20+ years) advocated for integrated systems planning and long-term climate frameworks informed by Indigenous knowledge (e.g., the Seven Generations principle). In contrast, early-career participants (under 10 years) focused on actionable, immediate strategies like workforce retraining, affordable retrofits, and renewable energy access, signaling a more implementation-driven orientation

Gendered patterns also emerged. Male participants, largely from regulatory or technical sectors, focused on structural reforms, grid capacity, and systemic design, while female participants, more active in policy, community, or academic roles, emphasized procedural fairness, inclusion, and the emotional and social dimensions of justice. Female participants were especially attuned to affordability, access, and availability as matters of dignity and care, often linking them to real-life trade-offs such as food versus warmth or health and housing insecurity. They emphasized the need for culturally and linguistically inclusive communication, particularly for Indigenous communities, newcomers, and other marginalized groups.

Male participants, while also acknowledging the importance of equity, more often framed these issues through the lens of systemic efficiency, infrastructure capacity, and institutional design. For example, affordability was discussed in terms of energy market dynamics and rate structures, with one participant noting that *"affordability will depend on who we're talking about—millionaires can afford things that a low-income earner cannot. I think the key here is equity and the progressive burden of costs"* (MX3). Access to information was associated with transparency and data governance, as highlighted by another who stressed that *"information feeds transparent, participatory, evidence-based processes…indicators are essential; for situational awareness and for knowing whether we're heading in the right direction"* (PR3). When discussing availability, men tended to focus on grid modernization, geographic service coverage, and energy security, with

one participant emphasizing that *"speaks to access to all, reliability, etc. Throughout history, the use of energy has been closely tied to many of civilization's most important indicators of health, prosperity, etc."* (CL1). These differences reflect broader gender and occupational roles, underscoring the importance of integrating both socially grounded and system-oriented perspectives into energy justice frameworks. Achieving a truly just transition in Ontario will require designing policies that respond to these diverse understandings and situate equity at their intersection.

These participant insights clearly underscore how perceptions of energy justice vary not only by gender but also by professional background and years of experience. While the literature has begun to document gendered disparities in energy access and policy-making, primarily focusing on women in consumer roles or in the Global South (Clancy & Roehr, 2003; Fathallah & Pyakurel, 2020; Feenstra & Özerol, 2021), it offers a comparatively limited exploration of how gender, age, and occupation shape justice perspectives among those working within the energy sector. Earlier studies (e.g., Clancy & Roehr, 2003) laid important foundations, but more recent work (Fathallah & Pyakurel, 2020; Feenstra & Özerol, 2021; Henriksen et al., 2025) confirms that these dynamics remain highly relevant today. Similarly, while the role of youth and elderly consumers has been examined in terms of vulnerability and participation (Henriksen et al., 2025), there is little research on how experience levels and institutional roles influence the priorities or interpretations of energy justice among industry professionals. This study helps fill that gap by illustrating that these variables significantly shape how justice is understood, prioritized, and operationalized on the ground. As such, energy justice frameworks must expand to include these occupational and experiential perspectives in order to more fully reflect the diversity of actors shaping the energy transition.

Despite perspectives on energy justice varying across professional and demographic lines, participants agreed on several key justice concerns. The following section examines these shared themes in greater depth by organizing them through the four tenets of energy justice.

5.2 Interpreting Findings using Energy Justice Tenets

While participants broadly agreed on the importance of embedding equity in Ontario's energy transition, there was strong consensus that existing policies and decision-making processes fall short of delivering inclusive outcomes. Their critiques, framed through the four tenets of energy justice, also point to deeper systemic factors that help explain why Ontario's energy sector remains inequitable.

I. Distributive Justice

Distributive justice within energy systems emphasizes the fair allocation of both the benefits and burdens of energy policies and transitions (Astola et al., 2022; Heffron, 2024; K. E. H. Jenkins et al., 2020; Wyse et al., 2021). In the Ontario context, participants consistently stressed that an equitable energy future must directly respond to historical injustices, structural inequalities, and geographical disparities. This theme revealed critical insights into how policies can, and should, redistribute opportunities and protections across marginalized and vulnerable populations.

Participants emphasized that distributive justice in Ontario's energy transition requires targeted public investment in Indigenous, rural, and low-income communities through subsidies, renewable access, and clean infrastructure (MX1). Green jobs and carbon revenues, they argued, should be directed toward community-owned energy systems like microgrids (MX1, MX3), while income-based energy efficiency programs should offer no-cost solutions to vulnerable groups (PR1). Government institutions were critiqued for perpetuating inequities through fossil fuel subsidies

and inadequate regulation, prompting calls for equity mandates and stronger policy frameworks (CE1, PR2). As PR2 bluntly noted:

> *"Government needs to make energy justice and distributive justice a priority and require its agencies to comply. I must be frank, I really only hear these concepts at conferences with guest speakers. I don't hear it in day-to-day discussions on energy policy."*

In addition to financial redistribution, experts stressed the need for redress of past harms through environmental monitoring, remediation (MX4), and community-led emissions planning (CE2), showing that distributive justice must empower communities to shape equitable, locally grounded energy futures. Together, these insights reflect a demand for equity-driven policies that go beyond rhetoric to actively redistribute resources, decision-making power, and environmental protections to those most impacted by energy injustice.

II. Procedural Justice

Procedural justice refers to the fairness, transparency, and inclusivity of decision-making processes (Astola et al., 2022; Heffron, 2024; K. E. H. Jenkins et al., 2020; Wyse et al., 2021). In the context of Ontario's energy transition, this theme emerged as critical for ensuring that diverse communities, especially those historically marginalized, have a genuine voice and agency in shaping energy futures.

Participants consistently expressed that current governance structures and policy-making processes fall short in several key areas, including public participation, transparency, power distribution, and representation. Participants emphasized that achieving procedural justice in Ontario's energy transition requires deep structural reforms that move beyond superficial consultation toward genuine empowerment of marginalized communities. Many criticized current processes as inaccessible or performative, calling for culturally appropriate, continuous

engagement, particularly with Indigenous, low-income, and rural groups (MX1, MX5). Barriers such as time, childcare, various socio-economic factors, and underrepresentation were noted as significant barriers to participation as well (MX5). Participants also raised concerns about private sector influence and opaque governance. RE1 stressed the need to: *"revamp all the rules at the Ontario Energy Board to ensure communities can be favored instead of large nuclear and fossil fuel conglomerates,"* while MX2 called for *"clearer insight into lobbying since Enbridge has too much access to policymakers"*. As MX3 described, "*Projects continue to get 'rammed' into communities, [where] environmental and other groups face a labyrinth of procedural challenges (they are often told 'interesting points, but this is not the right forum for those')*." This underscores not only tokenistic consultation but also the absence of any forum expansive enough to grapple with equity holistically. Paying attention to this broader uneven playing field is central to this thesis: it highlights why developing robust equity indicators matters, as these tools can help reshape procedural contexts that are currently closed or exclusionary.

Beyond access, participants demanded transparency in how public input informs outcomes (MX1) and advocated for redistributing decision-making power through community-led planning and more inclusive policy development (CE2, MX3). Some linked procedural justice to environmental integrity, cautioning against greenwashing and urging stronger ecological accountability in energy governance (CE1). This reflects the failure of current procedural frameworks to ensure transparency and inclusion in shaping energy policy. Overall, these perspectives reflect a call for deep institutional change, grounded in democratic accountability, community participation, and Indigenous sovereignty. At the same time, because this study focuses on expert perspectives rather than directly on equity-deserving groups themselves, further research

is needed to explore how these expert views intersect with the lived and experiential knowledge of communities most affected by Ontario's energy transition.

III. Recognition Justice

Recognition justice refers to the acknowledgment and inclusion of diverse identities, histories, knowledge systems, and lived experiences in decision-making processes (Astola et al., 2022; Heffron, 2024; K. E. H. Jenkins et al., 2020; Wyse et al., 2021). In Ontario's energy context, recognitional justice emerges as a foundational principle for rectifying historical exclusions and ensuring equitable participation in the future of energy policy. Experts emphasized that despite some progress, efforts to support Indigenous energy sovereignty remain fragmented and poorly institutionalized (MX1, MX4). As Participant MX1 asserted:

> *"100%, Indigenous communities are still being overlooked in the energy transition, even in 2025, which is shocking... I honestly can't stress enough how unacceptable it is that many organizations and companies are still not in the reconciliation space."*

This quote captures the sentiment that marginalized identities are often acknowledged rhetorically, but not consciously integrated into planning, governance, or ownership models. Language accessibility, culturally appropriate engagement, and intersectional policy design remain critical gaps. Respecting Indigenous rights and support for Indigenous-led projects were viewed as essential (MX1, MX4), along with reparative investments in affected communities.

Participants stressed that inclusion must go beyond symbolic gestures to ensure meaningful participation grounded in diverse knowledge systems and lived realities (MX5). Several respondents (CE1, PR1) recommended policy support tailored to underserved groups, such as incentives for non-market housing providers and income-scaled transit. Others emphasized the need to simplify regulatory procedures and clarify engagement processes to reduce access barriers

(MX3). Broader education and public narrative shifts were also seen as key to fostering inclusive understanding of energy justice across identities and regions (CE2, PR1, CE2, CL1). Overall, this calls for energy systems to be recognitional and inclusive not only in theory, but also in practice.

IV. Restorative Justice

Restorative justice, within the context of energy policy, extends beyond formal compensation. It involves addressing the legacy of environmental and social harm, empowering affected communities to shape their energy futures, and establishing partnerships to ensure that justice is not only retrospective but also proactive (Heffron, 2024; Wyse et al., 2021). Across participant responses, a coherent call emerged for Ontario's energy transition to meaningfully confront historical wrongs and ensure an equitable distribution of opportunities and benefits moving forward (MX1, MX5, CL1). However, this recognition must be followed by concrete actions such as financial compensation, community development funding, and remediation of polluted lands (CE1, SJ1).

Empowerment was central to many responses, with participants calling for community-led energy planning, localized ownership of infrastructure, and the development of solutions responsive to the needs and histories of specific communities (CE2, MX5, CL1, MX7). Critiques of continued reliance on fossil fuels and nuclear investments (CE1, MX4) underscored the importance of dismantling systems that have perpetuated harm. Several respondents also advocated for collaborative community models to identify what matters most to the people who live in these communities (CE2, MX7). Additionally, education and accessible technical expertise were identified as essential for equipping communities to participate (CL1). Collectively, these insights position restorative justice as an active, community-driven process of repair, redress, and reimagining of Ontario's energy future.

To deepen the connection between these findings and energy justice theory, it is important to note that expert perspectives in this study both affirm and extend existing frameworks. The alignment is evident in how participants articulated the four tenets not as isolated concerns, but as deeply interconnected and essential components of a just energy transition (Astola et al., 2022). As identified by Sovacool & Dworkin (2015), these tenets show how energy justice exists as a conceptual tool for uniting different justice concerns, an analytical tool for energy researchers seeking to understand how values are embedded in energy systems, and a decision-making tool that can help energy planners make more considered energy choices. Taken together, participants' reflections on the four tenets highlight the systemic and multi-dimensional nature of energy injustice in Ontario. Building on this thematic foundation, the next section examines gaps that undermine efforts to achieve equity and justice in practice.

5.3 Gaps Undermining Equity Outcomes

Taken together, the findings from this study reveal that Ontario's energy policies are not yet structurally designed to embed equity as a core principle, highlighting an urgent need to embed equity more deeply into Ontario's energy transition. While there are scattered initiatives and emerging models aimed at addressing disparities, systemic barriers such as centralized governance, political interference, and culturally disconnected outreach persist. Participants broadly framed energy justice as a multidimensional and contextual concern, one that encompasses not only economic and environmental factors but also social inclusion, procedural fairness, and historical redress.

Experts emphasized that key equity issues like affordability, availability, access to transparent information, and active involvement of underserved communities are not simply technical

problems to solve but ethical imperatives that must guide all stages of energy policy and implementation. As one climate expert noted:

> *"We already have most of the policies or procedures required. We just need fair procurement… We need a government that takes health, prosperity, and climate seriously."*

The quote reflects concerns over weak enforcement and inconsistent application. A community engagement specialist echoed this sentiment:

> *"Government needs to listen and act on the recommendations provided by experts and provide public consultation that actually takes feedback/questions seriously."*

The quote highlights procedural justice gaps between formal commitments and actual practice.

A dominant concern across responses was that equity is not meaningfully integrated into the policy design, development, or implementation phases of Ontario's energy transition. Although participants often agreed on key justice concerns, such as the need for Indigenous inclusion, economic fairness, and procedural accountability, they differed in their proposed solutions. Some advocated for technocratic and economic responses, such as scaling up distributed energy systems, investing in green jobs, or restructuring energy incentives. Others focused more on community empowerment and institutional reform, arguing that equity requires enabling marginalized communities to shape, not just receive, the benefits of the transition.

Low energy literacy and misinformation also emerged as major obstacles. Several participants warned that resistance to the transition, particularly to renewables, was exacerbated by public misinformation and political narratives that favor the status quo. One climate expert remarked:

> *"Public opinion needs to be swayed to the advisability of cheaper, healthier energy… Misinformation must be systematically exposed and countered (e.g., wind turbines don't work, are too noisy and cause headaches)."*

The participant calls for clear public communication strategies and restrictions on fossil fuel advertising. Without coordinated, culturally informed education efforts, Ontario risks losing public trust and legitimacy, making equity not only a governance concern but also a communication challenge.

Several experts also spoke about the broader challenges and solutions shaping Ontario's transition. The dominant critique was that the province's approach is outdated, overly reliant on centralized systems, reactive affordability programs, and weak public engagement processes. Participants proposed a range of reforms: expanding community ownership, embedding climate and equity mandates into legislation, and modernizing grid infrastructure to improve accessibility for remote and underserved regions. Solutions ranged from high-level governance reform to grassroots capacity building, but all shared a common belief that energy justice must be proactively operationalized, not treated as a secondary goal.

This persistent gap between policy commitments and systemic practice underscores the importance of not just identifying vulnerable groups but also designing structures that redistribute power, recognize local knowledge, and ensure accountability. The next section explores expert critiques of current equity indicators and proposes a more holistic, grounded set of metrics for operationalizing energy justice.

5.4 The Need for More Nuanced Indicators

According to Wyse et al. (2021), while the existing indicators offer a valuable starting point for assessing justice, they have limitations. They explained this using the involvement indicator, which captured who participated in consultation efforts, but did not assess the depth of their participation or whether their concerns were meaningfully addressed. The findings from this study

support the literature, underscoring the need to expand the existing set of energy justice indicators to reflect the complex, lived realities of energy transitions in Ontario.

While participants acknowledged the relevance of standard indicators such as affordability, availability, information, and involvement, they also criticized them as overly generic and insufficiently equipped to capture the depth of justice concerns on the ground. For example, affordability was not simply about price but about equitable energy access across income levels, geographic regions, and housing types (MX1, PR2, MX3). Similarly, involvement was seen as requiring more than superficial consultation; it demanded mechanisms for real influence and structural inclusion (CE2, MX3, PR3).

Participants proposed a holistic and multidimensional set of indicators to evaluate energy justice in Ontario, spanning economic, environmental, social, technical, and procedural domains. This underscores the necessity of developing more nuanced and localized indicators for evaluating energy justice. These included affordability metrics such as the ratio of energy costs to income and energy poverty metrics (MX1, SJ1, CE2, MX2, PR1, PR3, MX7); environmental indicators like pollution exposure and ecosystem degradation (CE1, SJ1, MX4, CL1); and health-related metrics such as respiratory illness incidence (MX1, MX4, SJ1, CL1). Governance-focused indicators emphasized community consultation, representation in decision-making, and culturally respectful engagement (MX1, CE1, RE1, MX5, CL1, PR2), while equity scorecards were suggested to track demographic inclusion in green jobs (MX4) and to guide workforce retraining in fossil-fuel-dependent regions (RE1, MX3). Experts also highlighted the need for indicators addressing local renewable access and ownership as well as energy access disparities among vulnerable populations, such as newcomers and unhoused individuals (MX2, CE2, RE1, CL1). Scholars have increasingly questioned the sufficiency of conventional metrics and called for participatory,

intersectional, and geographically attuned approaches to indicator design. These proposed metrics both affirm and extend global calls for participatory, intersectional, and geographically grounded approaches to measuring justice in energy transitions.

To move from symbolic commitments to operational justice, participants emphasized the need to institutionalize equity indicators through clearly defined terms, routine measurement, and transparent governance structures. This included establishing legal definitions of energy poverty (PR1), embedding restorative justice into remediation programs for historically harmed communities (MX1, MX5), and mandating equity impact assessments in energy planning processes (MX5, CE2). Experts stressed that indicators should not be static metrics but dynamic tools to guide inclusive planning, monitor progress, and enable course correction through feedback mechanisms.

Participants proposed various domains where these indicators could be applied: equity scorecards for green job access (MX4), community-based data collection to capture local realities (MX4, MX3), and integrated planning frameworks that incorporate social, economic, and environmental dimensions (CE2, CL1). Several also called for long-term, intergenerational thinking rooted in Indigenous teachings, such as the 'seven generations' principle (CE1), to ensure sustainability and accountability beyond short-term political cycles. Collectively, these proposals help bridge the gap between theory and practice by grounding indicator design in community realities, power asymmetries, and procedural fairness, pushing energy justice from aspiration toward enforceable, evaluative policy frameworks.

The proposed indicators not only respond to immediate governance needs but also offer new insights for theory building. The following section situates the study's findings within the broader energy justice literature, highlighting both points of alignment and theoretical advancement.

5.5 Alignment and Contribution to Energy Justice Literature

This study makes several important contributions to the energy justice literature by grounding it in expert-based insights and applying them to the Ontario energy context. While the findings broadly reinforce the established four tenets of energy justice (distributive, procedural, recognition, and restorative) as articulated by Sovacool et al., (2016) and Heffron & McCauley (2017), they also push the boundaries of current theoretical models through local interpretations and methodological refinements.

Participants articulated energy justice through an intersectional and systemic lens, integrating social, ecological, and institutional concerns. Their responses consistently affirmed the importance of affordability, access to clean and reliable energy, culturally appropriate information, and inclusive governance structures. These affirmations validate the continued relevance of dominant energy justice frameworks, particularly in assessing the structural dimensions of Ontario's energy transition.

Where this study advances the literature is in its exposure of persistent political and institutional barriers that hinder the operationalization of justice principles. Participants highlighted a lack of political will, the performative nature of public consultations, and the continued prioritization of monopolistic actors as challenges that are underexamined in existing frameworks. Moreover, this research repositions energy transitions not only as a technical or economic transition but as a justice opportunity, particularly through community-based, Indigenous-led, and distributed ownership models.

Ontario's energy transition policies often fall short of delivering equitable and inclusive outcomes. As the literature notes, financial supports like the Ontario Clean Energy Benefit and

Fair Hydro Plan provided short-term relief but failed to address systemic affordability issues due to regressive cost structures and insufficient targeting (Das et al., 2022; Office of the Auditor General of Ontario, 2017). While the 2017 Auditor General report is somewhat dated, it remains relevant because it documents systemic affordability issues that participants in 2025 affirmed are still unresolved. Programs like the Feed-in Tariff (FIT), intended to democratize energy production, ended up benefiting actors with more resources, marginalizing communities lacking capital, legal support, or time to navigate the complex approval systems (McMurtry & Tarhan, 2019; Tarhan, 2022). This critique is echoed by participants who identified energy affordability and equity as a central challenge, warning that *"rising energy costs could exacerbate energy poverty for low-income households"* (MX1).

Additionally, the literature critiques top-down governance approaches for excluding Indigenous and rural voices (Fast & Mabee, 2015; Hunsberger & Awâsis, 2019), and although somewhat dated, these critiques remain highly relevant, as participants in 2025 echoed the same concerns about exclusion, procedural justice, and the limitations of centralized governance. They also emphasized the need to involve rural and Indigenous communities in energy projects and improve procedural justice. The inconsistency in defining energy poverty and the exclusion of renters from retrofit programs (Calvert et al., 2022; Das et al., 2022) were also identified by participants as key gaps, underscoring calls for intersectional and community-driven reforms. As illustrated by Ontario's Green Energy Act, centralized governance structures that privilege technocratic expertise over local participation often erode trust and accountability, highlighting a broader justice challenge that this study's findings reaffirm. Thus, both empirical findings and expert feedback reveal that Ontario's policies, though well-intentioned, often remain performative, lacking in structural mechanisms that operationalize justice in practice.

The expert responses also introduced novel or underexplored dimensions of energy justice, including mental health impacts, intergenerational concerns, and the role of culturally resonant communication strategies. These insights suggest that conventional energy justice frameworks may insufficiently account for the emotional, behavioral, and epistemic dimensions of equity, which are highly relevant in specific local contexts like Ontario.

Methodologically, this study contributes by demonstrating the value of expert-based qualitative inquiry in evaluating justice indicators. The proposed indicators offer a more granular, context-sensitive toolkit for assessing energy equity, bridging the gap between abstract theoretical models and the practical demands of policymaking and planning. In doing so, this research encourages a more holistic and adaptable approach to energy justice scholarship, one that better reflects the complexity of real-world transitions.

This study contributes theoretically by extending the existing energy justice literature through a grounded analysis of how justice is interpreted and operationalized by diverse actors within Ontario's energy sector. It highlights underexplored justice dimensions such as emotional and intergenerational equity, culturally resonant communication, and institutional positionality, thereby broadening conventional frameworks beyond distributive and procedural concerns. It also introduces a novel occupational and experiential lens, demonstrating how professional roles and lived experiences shape justice priorities, and underscores the importance of integrating system-level and socially embedded perspectives for the future.

Practically, the study contributes by identifying actionable policy recommendations informed by participant insights and local context. These include community-informed justice indicators, culturally inclusive engagement strategies, institutional reforms to embed procedural fairness, and investment approaches rooted in distributive and restorative justice. These insights offer a concrete

foundation for policymakers, regulators, and energy planners seeking to move from rhetorical equity commitments to structural transformation in Ontario's energy transition.

By grounding the literature using empirical insights, this study contributes to a more situated and actionable understanding of energy justice. The closing section builds on this foundation to reflect on practical strategies for operationalizing justice in Ontario's energy transition.

5.6 Final Reflection & Operationalizing Energy Justice in Ontario

Ontario's energy transition is at a critical crossroads. It is not merely a technical endeavor, but a political and ethical undertaking that demands the operationalization of equity at every level. While policy discourse increasingly acknowledges the importance of justice, participant insights reveal that equity often remains aspirational, lacking concrete mechanisms for implementation. Public consultations are frequently tokenistic, affordability programs reactive, and infrastructure decisions, particularly those involving nuclear and natural gas, continue to marginalize vulnerable communities. Participants consistently stressed that energy justice must be embedded structurally, with clear accountability systems and participatory governance frameworks that address both historical and ongoing injustices.

Despite these concerns, participants highlighted several promising models for operationalizing energy justice, particularly through Indigenous-led and community-based partnerships. One participant (MX1) described their pride in collaborating with Indigenous communities and with companies like Ontario Power Generation (OPG), which have implemented reconciliation action plans and support women in energy. These partnerships mark an emerging shift toward more respectful, rights-based approaches to energy planning. Expert PR3 described Hydro One's Indigenous partnership model as "leading edge," offering a tangible pathway to rectify past harms

while co-creating equitable futures. Participant RE1 similarly pointed to community-based renewable energy initiatives in places such as Denmark, Germany, California, Nova Scotia, and First Nations communities across Canada as empirical proof of the feasibility and value of Indigenous energy sovereignty. These examples not only highlight what is possible but also affirm that justice-based energy planning is both practical and morally imperative.

To address Ontario's current gaps, participants proposed pragmatic, justice-oriented strategies rooted in the four tenets of energy justice. As MX3 emphasized, "*Integrated planning should be implemented across all energy forms, not in silos as is currently done, with enhancements around opportunities for Indigenous participation including integration of policy, regulation, and business."* This call for systemic, transformative approaches reflects a core insight of this study: that Ontario's transition requires not only targeted interventions, but also a reconfiguration toward holistic, multivalent strategies. Procedural justice demands institutional reforms that embed continuous, culturally appropriate engagement and expand local planning capacity. Distributive justice requires targeted investments in low-income, Indigenous, and rural communities, alongside equity-based pricing and access to community-owned renewables. Recognition justice calls for meaningful inclusion of diverse identities and knowledge systems, particularly through Indigenous-led energy sovereignty and multilingual outreach. Restorative justice requires tangible repair through environmental remediation, economic reinvestment, and long-term partnerships with historically burdened communities.

Operationalizing energy justice in Ontario thus requires, as participants consistently argued, a reorientation of energy governance, from fragmented, short-term solutions to holistic, long-term transformation. Equity must be institutionalized through legislative mandates, transparent data systems, and shared decision-making processes that recognize diverse forms of expertise and lived

experience. Participants called for equity-based pricing structures, accessible data systems, targeted investment in underserved regions, and intergenerational planning frameworks rooted in Indigenous knowledge, such as the Seven Generations principle. As this study demonstrates, energy justice is not simply about the quantity or source of energy but how it is produced, for whom, with whose voice, who benefits, and who bears the costs.

While this study offers critical insights from a diverse group of experts, it does not include direct perspectives from community members most affected by energy injustice. This expert-driven approach offers valuable strategic and institutional insights, but it also risks overlooking the lived realities, place-based knowledge, and emotional dimensions that community voices uniquely provide. Several participants emphasized the importance of grounding policy in local experience and participatory design. As such, future research should more directly involve frontline and community voices, since it is their day-to-day experiences and coping strategies that often illuminate justice gaps not visible from institutional vantage points. Expanding the scope of inquiry to include these perspectives will be essential to fully capturing the lived contours of energy justice and ensuring that policy and planning are responsive to those most impacted.

Taken together, these findings respond directly to the central research question, illustrating how equity is currently understood and where systemic change is needed to embed justice more effectively in energy decision-making across Ontario. By critically engaging with both thematic and positional variations in justice interpretation, the discussion chapter has reinforced and extended the empirical findings, translated them into actionable frameworks, and situated them within broader theoretical and policy conversations. These reflections provide a foundation for the concluding chapter, which offers a synthesis of the study's core contributions and identifies future directions for research, policy, and practice.

Chapter 6: Conclusion

This concluding chapter synthesizes the purpose, key findings, and implications of the study. It begins with a summary of the research objectives and methodology, followed by a discussion of the core insights gained from expert perspectives on equity in Ontario's energy transition. Drawing from these findings, the chapter outlines practical policy recommendations aimed at embedding energy justice principles into decision-making processes. It also reflects on the study's limitations and proposes directions for future research, before concluding with a final reflection on the significance of this work and the path forward for achieving a more just and inclusive energy transition in Ontario.

6.1 Summary of Study Purpose and Methodology

This study set out to examine how equity considerations are currently, and how they could be more effectively integrated into decision-making processes in Ontario to support a more just and inclusive energy transition. Guided by the energy justice theory, the research focused on understanding expert perspectives on equity, identifying a more nuanced set of equity indicators, and assessing how these indicators can be used to evaluate and inform energy policy and planning.

A qualitative, expert-informed approach was adopted using open-ended surveys with 15 energy experts from across Ontario. Purposeful and snowball sampling captured a diverse range of expertise from Ontario's energy landscape, including policymakers, community engagement professionals, renewable energy experts, and social justice advocates, among others. Thematic analysis, supported by NVivo software, enabled a rich exploration of nuanced justice perspectives across professional, experiential, and gender lines.

6.2 Key Research Findings

This study set out to investigate how equity is understood, assessed, and operationalized in Ontario's energy sector, drawing on the insights of energy experts from diverse sectors. The findings reveal a complex and often contradictory picture where equity is frequently acknowledged in rhetoric but rarely embedded in practice, constrained by institutional inertia, technocratic priorities, and fragmented governance. These findings directly reflect participant critiques of centralized governance, tokenistic consultation, and inequitable affordability programs.

What emerges is not a simple list of issues, but a broader insight: that achieving a just energy transition in Ontario requires a multivalent approach, one that integrates technical, social, environmental, and governance dimensions, and centers the lived realities of those most affected by energy decisions.

Experts widely agreed that equity is often treated as an aspirational add-on rather than a guiding principle, with current planning dominated by economic and technical considerations. Procedural and recognition justice remain particularly underdeveloped, as decision-making processes exclude Indigenous communities, low-income households, and other marginalized groups. While existing equity indicators remain relevant, experts emphasized that these must be more context-specific, disaggregated, and informed by cultural data, underscoring that equity cannot be captured by generic metrics.

This critique echoes recent Ontario-focused studies documenting similar gaps in equity policy implementation (Calvert et al., 2022; Das et al., 2022; Hunsberger & Awâsis, 2019), and remains consistent with participants' first-hand accounts of exclusion in policy and planning. Many called for additional indicators and stressed that these metrics must be co-developed by the lived

experiences of those most impacted to carry legitimacy. Their critiques also pointed to systemic gaps in current energy policies, showing a clear mismatch between stated goals and outcomes, including affordability programs and renewable incentives that disproportionately benefit affluent homeowners while excluding renters and low-income populations. Without stronger accountability tools and governance reform, efforts to integrate equity risk propagating the very injustices they aim to resolve.

Taken together, these findings suggest that equity cannot be retrofitted into existing systems; rather, it must be embedded from the ground up. Now is a critical moment to reflect on Ontario's energy transition, especially amid shifting political priorities, growing energy demand, and climate urgency. Listening to expert voices helps reveal not only where gaps lie but what is needed to move toward meaningful, justice-oriented change. This study offers a foundation for future research to deepen community-based engagement and for policymakers to consider institutional reforms that make equity measurable, enforceable, and central to energy planning.

6.3 Practical Implications and Policy Recommendations

Based on the findings across all three objectives, this study offers several practical recommendations for policymakers, utilities, regulators, and advocates working toward a more equitable energy transition in Ontario. The participants offered a sharp critique of Ontario's energy governance structures. Many described the province's current decision-making processes as overly centralized, top-down, and dominated by corporate interests. Characteristics that not only exclude community voices but also perpetuate structural inequities. There were repeated calls for inclusive and participatory policy design, particularly mechanisms that recognize and address the needs of historically marginalized populations. Experts emphasized that access to clean, reliable, and affordable energy must be treated as a guaranteed right, especially for communities traditionally

excluded from governance. They also cautioned against policy decisions that reinforce existing inequalities, such as ongoing support for fossil fuel infrastructure, and underscored the need for governance models that are updated to reflect contemporary equity goals. This reflects the participant consensus that equity must be designed into regulatory mandates, not bolted on as afterthoughts.

The findings of this study point to a pressing need for equity to move from principle to practice in Ontario's energy sector. To achieve this, equity indicators must be integrated into regulatory and utility planning through mandatory equity audits, disaggregated data systems, and performance monitoring that capture the lived experiences of diverse communities. Procedural justice should be strengthened by embedding inclusive, sustained, and transparent public engagement across all stages of energy planning, using co-designed planning processes, citizen assemblies, and community ownership models, especially for renewable energy and energy efficiency retrofits. Complementary policies such as inclusive net metering, tiered pricing, and accessible financing mechanisms for distributed energy resources are also essential to support more equitable access and participation.

At a governance level, institutional mandates must be realigned to center justice, particularly within key agencies such as the Ontario Energy Board (OEB), the Independent Electricity System Operator (IESO), and the Ministry of Energy. This includes embedding restorative justice through reparative investment in communities disproportionately affected by historical harms, environmental burdens, and systemic exclusion. Structural reforms should be advanced through legislative mandates, inclusive funding frameworks, and capacity-building support for community-led energy initiatives. Most critically, equity must be treated as a foundational design principle, not a secondary objective, ensuring that energy policies are assessed not only by

technical or economic metrics, but by whose futures are secured, whose knowledge is respected, and whose agency is restored.

6.4 Limitations & Implications for Future Research

This study offers an expert-informed framework of equity indicators to guide more just energy policymaking in Ontario. While the research draws on the perspectives of a diverse group of professionals, it does not include the direct voices of communities most affected by energy transitions. This represents a key limitation, as the lived experiences of marginalized groups are essential to shaping responsive and effective equity frameworks. Several experts also criticized the prioritization of economic growth and cost-efficiency over equity, noting the absence of separate equity data that results in one-size-fits-all policies. This gap underscores the need for future research led by equity-deserving groups themselves, such as Indigenous communities, renters, or newcomers, who can define their own justice indicators and transition priorities from within their lived realities. Future work should also examine how expert perspectives interact with, or sometimes diverge from, community-based knowledge, as this intersection is critical for bridging institutional strategy with lived realities.

In addition, further research is needed to test the proposed indicators in real-world policy evaluation and planning processes, tracking how equity evolves as initiatives are implemented. Developing applied tools, such as energy equity dashboards, participatory metrics, and integrated justice planning frameworks, will be critical in translating these indicators into actionable instruments. Given the pace of Ontario's current transition decisions in 2024–2025, such tools would provide timely accountability mechanisms. Scholars and practitioners should also explore restorative governance models that explicitly redistribute power, resources, and decision-making authority, as well as examine intersectional energy injustices across race, gender, class, ability,

and geography to ensure solutions are appropriately targeted. Finally, future work should focus on strengthening public accountability mechanisms to ensure institutional transparency, responsiveness, and equity-centered evaluation.

One further limitation is that a number of recent Ontario policy initiatives, such as the 2025 Energy for Generations Integrated Energy Plan, the Protect Ontario by Securing Affordable Energy for Generations Act (Bill 40), and the launch of new equity-oriented directives for the OEB and IESO, did not surface in participant responses (Ministry of Energy and Mines, 2025a, 2025b). This absence may reflect the design of the survey, which oriented participants toward systemic themes such as governance, affordability, and Indigenous rights, rather than detailed commentary on specific legislative or regulatory documents. It may also indicate a time-lag between the introduction of new policies and their uptake in expert discourse or practice. Future research should therefore examine how these recent policies are shaping, or failing to shape, equity outcomes in practice, and why they were not raised in expert discussions, to better link policy design with justice-oriented implementation and outcomes.

6.5 Final Thoughts

Ontario is undergoing a pivotal energy transition. When this study began in early 2024, the province faced rising electricity demand, aging infrastructure, nuclear refurbishments, and growing public concern over affordability and climate action. As of mid-2025, these challenges remain urgent, yet equity continues to be sidelined in energy policy and planning. This transition moment is not only technical, but profoundly social and political.

This research responds to that moment by exploring expert-informed critiques of existing equity indicators and highlighting the limitations of current approaches, calling for more context-

specific, justice-oriented metrics. It also identifies gaps in how equity is currently addressed and proposes practical pathways to embed justice into policy, regulatory, and planning processes. Drawing on insights from diverse professionals, the study bridges technical, social, and institutional perspectives, revealing how these dimensions are deeply interconnected and why addressing equity in isolation risks overlooking the barriers that shape energy access and decision-making.

The disconnect between expert perspectives and government action prompts a critical question: if these equity-oriented insights are not reflected in current practices, whose expertise is guiding Ontario's energy transition, and what voices are being excluded? Academically, this study advances the field by contributing a localized, operational framework to the literature on energy justice and equitable energy transitions. It addresses recent calls in the literature for context-specific equity metrics and applied tools that move beyond theoretical discussion into actionable change. It holds value for scholars, policymakers, and advocates working to ensure that energy transitions deliver not just decarbonization, but justice.

This study argues that a more just and sustainable energy transition in Ontario requires a multivalent approach, one that integrates environmental, technical, economic, governance, and social dimensions. Energy transitions are neither inherently just nor are they automatically oriented toward equity. Rather than treating justice as an add-on to a technically and economically driven transition, the findings underscore the need to confront the social and structural inequities that shape energy policy and practice. In fact, as both experts in this study and recent Ontario scholarship (Calvert et al., 2022; Das et al., 2022) show, current approaches often reproduce or deepen existing injustices, especially when driven by powerful political and corporate interests. Rather than addressing historical marginalization, these transitions can sideline Indigenous

sovereignty, overlook principles like Free, Prior, and Informed Consent (FPIC), and weaken environmental protections under the guise of progress.

The findings and recommendations presented here outline a direction forward. One where equity is not a secondary consideration, but a foundational principle. Looking ahead, the challenge is not whether Ontario will transition, but how, and for whom. The province must shift from top-down governance toward inclusive, reparative, and community-driven approaches. Moving forward, a just energy transition in Ontario must be measured not only by kilowatts delivered, but by whose futures are secured, whose knowledge is respected, and whose agency is restored.

References

Abimbola, O., Aikins, J. K., Makhesi-Wilkinson, T., & Roberts, E. (2021). *Racism and Climate (In)Justice*.

Aguilar, F. I., & Gibson, R. B. (2023). Advancing a New Generation of Sustainability-Based Assessments for Electrical Energy Systems: Ontario as an Illustrative Application—A Review. *Energies*, *16*(17), 6285. https://doi.org/10.3390/en16176285

Albo, G., & Evans, B. (Eds.). (2018). *Divided province: Ontario politics in the age of neoliberalism*. McGill-Queen's University Press.

Allison, J. E., McCrory, K., & Oxnevad, I. (2019). Closing the renewable energy gender gap in the United States and Canada: The role of women's professional networking. *Energy Research & Social Science*, *55*, 35–45. https://doi.org/10.1016/j.erss.2019.03.011

Alook, A., Eaton, E., Gray-Donald, D., Laforest, J., Lameman, C., & Tucker, B. (2023). *The End of This World*. https://btlbooks.com/book/the-end-of-this-world

Anfinsen, M., & Heidenreich, S. (2017). *(PDF) Energy & gender—A social sciences and humanities cross- cutting theme report*. ResearchGate. https://www.researchgate.net/publication/318969513_Energy_gender_-_a_social_sciences_and_humanities_cross-_cutting_theme_report

Angheloiu, C., & Tennant, M. (2020). Urban futures: Systemic or system changing interventions? A literature review using Meadows' leverage points as analytical framework. *Cities*, *104*, 102808. https://doi.org/10.1016/j.cities.2020.102808

Astola, M., Laes, E., Bombaerts, G., Ryszawska, B., Rozwadowska, M., Szymanski, P., Ruess, A., Nyborg, S., & Hansen, M. (2022). Community Heroes and Sleeping Members: Interdependency of the Tenets of Energy Justice. *Science and Engineering Ethics*, *28*(5), 45. https://doi.org/10.1007/s11948-022-00384-3

Baruah, B. (2017). Renewable inequity? Women's employment in clean energy in industrialized, emerging and developing economies. *Natural Resources Forum*, *41*(1), 18–29.

Basu, S., & Bale, C. S. E. (2023). A framework for exploring futures of complex urban energy systems. *Frontiers in Climate*, *5*, 1145277. https://doi.org/10.3389/fclim.2023.1145277

Bazilian, M., Nakhooda, S., & Van de Graaf, T. (2014). Energy governance and poverty. *ENERGY RESEARCH & SOCIAL SCIENCE*, *1*, 217–225. https://doi.org/10.1016/j.erss.2014.03.006

Biswas, S., Echevarria, A., Irshad, N., Rivera-Matos, Y., Richter, J., Chhetri, N., Parmentier, M. J., & Miller, C. A. (2022). Ending the Energy-Poverty Nexus: An Ethical Imperative for Just Transitions. *Science and Engineering Ethics*, *28*(4), 36. https://doi.org/10.1007/s11948-022-00383-4

Calvert, K., Smit, E., Wassmansdorf, D., & Smithers, J. (2022). Energy transition, rural transformation and local land-use planning: Insights from Ontario, Canada. *Environment and Planning E: Nature and Space*, *5*(3), 1035–1055. https://doi.org/10.1177/25148486211024909

Canadian Climate Institute. (n.d.). The Big Switch—Electricity Transformation Canada. *Canadian Climate Institute*. Retrieved June 22, 2025, from https://climateinstitute.ca/reports/big-switch/

Casey, L. (2025, July 7). Ontario premier signs agreement with Alberta to build Ring of Fire railway. *CBC News*. https://www.cbc.ca/news/canada/toronto/ford-smith-ontario-alberta-mous-1.7578915

City of Toronto. (2016). *Ontario Green Investment Fund Benefitting Social Housing—Social Housing Apartment Retrofit Program (SHARP)*. https://www.toronto.ca/legdocs/mmis/2016/cd/bgrd/backgroundfile-92865.pdf

City of Toronto. (2017, November 17). Home Energy Loan Program. *City of Toronto*. https://www.toronto.ca/services-payments/water-environment/environmental-grants-incentives/home-energy-loan-program-help/

City of Toronto. (2018). *Report for action: Ontario climate action plan—Social housing apartment improvement program (SHAIP)*. https://www.toronto.ca/legdocs/mmis/2018/ex/bgrd/backgroundfile-111948. pdf.

City of Toronto. (2019, January 12). *Decision document: Community development and recreation committee*. https://www. toronto.ca/legdocs/mmis/2009/cd/decisions/2009-01-12-cd21-dd.pdf.

Clancy, J., Daskalova, V., Feenstra, M., Franceschelli, N., & Sanz, M. (2017). *Gender Perspective on Access to Energy in the EU*. https://www.europarl.europa.eu/thinktank/en/document/IPOL_STU(2017)596816

Clancy, J., & Roehr, U. (2003). Gender and energy: Is there a Northern perspective?1. *Energy for Sustainable Development*, *7*(3), 44–49. https://doi.org/10.1016/S0973-0826(08)60364-6

Creswell, J. W., & Creswell, J. D. (2022). *Research Design_ Qualitative, Quantitative, and Mixed Methods Approaches* (Sixth Edition). SAGE Publications, Inc.

Cuenca, J. J., Daly, H. E., & Hayes, B. P. (2023). Sharing the grid: The key to equitable access for small-scale energy generation. *Applied Energy*, *349*, 121641. https://doi.org/10.1016/j.apenergy.2023.121641

Das, R. R., Martiskainen, M., Bertrand, L. M., & MacArthur, J. L. (2022). A review and analysis of initiatives addressing energy poverty and vulnerability in Ontario, Canada. *Renewable and Sustainable Energy Reviews*, *165*, 112617. https://doi.org/10.1016/j.rser.2022.112617

Edenhofer, O., Pichs-Madruga, R., Sokona, Y., Seyboth, K., Kadner, S., Zwickel, T., Matschoss, P., Eickemeier, P., Hansen, G., Schlömer, S., & Stechow, C. von. (2012). Renewable energy sources and climate change mitigation: Special report of the Intergovernmental Panel on Climate Change. *Choice Reviews Online*, *49*(11), 49-6309-49–6309. https://doi.org/10.5860/CHOICE.49-6309

Elston, M. (2012, December 1). Report of the Ontario Distribution Sector Review Panel. *Council for Clean and Reliable Energy*. https://thinkingenergy.ca/report-of-the-ontario-distribution-sector-review-panel/

Enbridge Gas Distribution Inc. (2016). *Customers Save Money and Energy with the New Enbridge Gas Smart Thermostat Program*. http://enbridgegas.mediaroom.com/news-releases?item=122507

Environmental Commissioner of Ontario (ECO). (2018). *Making Connections—Straight Talk About Electricity in Ontario: 2018 Energy Conservation Progress Report, Volume One*.

Fast, S., & Mabee, W. (2015). Place-making and trust-building: The influence of policy on host community responses to wind farms. *Energy Policy*, *81*, 27–37. https://doi.org/10.1016/j.enpol.2015.02.008

Fathallah, J., & Pyakurel, P. (2020). Addressing gender in energy studies. *Energy Research and Social Science*, *65*(101461). https://doi.org/10.1016/j.erss.2020.101461

Feenstra, M., & Özerol, G. (2021). Energy justice as a search light for gender-energy nexus: Towards a conceptual framework. *Renewable and Sustainable Energy Reviews*, *138*, 110668. https://doi.org/10.1016/j.rser.2020.110668

Ferrall-Wolf, I., Gill-Wiehl, A., & Kammen, D. M. (2023). A bibliometric review of energy justice literature. *Frontiers in Sustainable Energy Policy*, *2*, 1175736. https://doi.org/10.3389/fsuep.2023.1175736

Financial Accountability Office of Ontario. (2020). *Nuclear Refurbishment—An Assessment of the Financial Risks of the Nuclear Refurbishment Plan*. https://www.brucepower.com/wp-content/uploads/2020/01/Nuclear-Refurb-EN.pdf

Financial Accountability Office of Ontario. (2022). Ontario's Energy and Electricity Subsidy Programs. *Financial Accountability Office of Ontario*. https://fao-on.org/en/report/energy-and-electricity-2022/

Forman, A. (2017). Energy justice at the end of the wire: Enacting community energy and equity in Wales. *Energy Policy*, *107*, 649–657. https://doi.org/10.1016/j.enpol.2017.05.006

Fraune, C. (2016). The politics of speeches, votes, and deliberations: Gendered legislating and energy policy-making in Germany and the United States. *Energy Research & Social Science*, *19*, 134–141. https://doi.org/10.1016/j.erss.2016.06.007

Fuller, S., & McCauley, D. (2016). Framing energy justice: Perspectives from activism and advocacy. *Energy Research & Social Science*, *11*, 1–8. https://doi.org/10.1016/j.erss.2015.08.004

Gajevic Sayegh, A., Cadieux, H., Ouellet, C., Desrosiers, J., & Dufresne, Y. (2025). Just Transition and Social Acceptability: A Canadian Case. *Ethics, Policy & Environment*, 1–24. https://doi.org/10.1080/21550085.2025.2496835

Goldthau, A., & Sovacool, B. K. (2012). The uniqueness of the energy security, justice, and governance problem. *Energy Policy*, *41*, 232–240. https://doi.org/10.1016/j.enpol.2011.10.042

Government of Ontario. (2017). *Archived—Minister's Climate Change Action Plan progress report 2017*. http://www.ontario.ca/page/ministers-climate-change-action-plan-progress-report-2017

Government of Ontario. (2021). *Published plans and annual reports 2021-2022: Ministry of Energy, Northern Development and Mines | ontario.ca*. http://www.ontario.ca/page/published-plans-and-annual-reports-2021-2022-ministry-energy-northern-development-and-mines

Government of Ontario. (2024). *Province Launches Largest Competitive Energy Procurement in Ontario History*. News.Ontario.Ca. https://news.ontario.ca/en/release/1004981/province-launches-largest-competitive-energy-procurement-in-ontario-history

Hamstead, Z. A., Iwaniec, D. M., McPhearson, T., Berbés-Blázquez, M., Cook, E. M., & Muñoz-Erickson, T. A. (Eds.). (2021). *Resilient Urban Futures*. Springer International Publishing. https://doi.org/10.1007/978-3-030-63131-4

Harris, W. M., Beck, M., & Gerasimchuk, I. (2015). *The End of Coal: Ontario's coal phase-out*.

Heffron, R. J. (2024). Energy justice – the triumvirate of tenets revisited and revised. *Journal of Energy & Natural Resources Law*, *42*(2), 227–233. https://doi.org/10.1080/02646811.2023.2256593

Heffron, R. J., & McCauley, D. (2017). The concept of energy justice across the disciplines. *Energy Policy*, *105*, 658–667. https://doi.org/10.1016/j.enpol.2017.03.018

Heffron, R. J., McCauley, D., & Sovacool, B. K. (2015). Resolving society's energy trilemma through the Energy Justice Metric. *Energy Policy*, *87*, 168–176. https://doi.org/10.1016/j.enpol.2015.08.033

Henriksen, I. M., Strömberg, H., Branlat, J., Diamond, L., Garzon, G., Kuch, D., Yilmaz, S., & Motnikar, L. (2025). The role of gender, age, and income in demand-side management acceptance: A literature review. *Energy Efficiency*, *18*(3), 17. https://doi.org/10.1007/s12053-025-10304-6

Hernández, D. (2015). Sacrifice Along the Energy Continuum: A Call for Energy Justice. *Environmental Justice*, *8*(4), 151–156. https://doi.org/10.1089/env.2015.0015

Herrero, S. T. (2017). Energy poverty indicators: A critical review of methods. *Indoor and Built Environment*, *26*(7), 1018–1031. https://doi.org/10.1177/1420326X17718054

Hill, B., & Mauracher, J. (2020, March). *Ontario's latest electricity measures leave out hundreds of thousands of customers*. Global News. https://globalnews.ca/news/6732824/coronavirus-ontarios-latest-electricity-measures-leave-out-hundreds-of-thousands-of-customers/

Hoang, A. T., Pham, V. V., & Nguyen, X. P. (2021). Integrating renewable sources into energy system for smart city as a sagacious strategy towards clean and sustainable process. *Journal of Cleaner Production*, *305*, 127161. https://doi.org/10.1016/j.jclepro.2021.127161

Hoicka, C. E., Zhao, Y., McMaster, M.-L., & Das, R. R. (2022). Diffusion of demand-side low-carbon innovations and socio-technical energy system change. *Renewable and Sustainable Energy Transition*, *2*, 100034. https://doi.org/10.1016/j.rset.2022.100034

Hunsberger, C., & Awâsis, S. (2019). Energy Justice and Canada's National Energy Board: A Critical Analysis of the Line 9 Pipeline Decision. *Sustainability*, *11*(3), 783. https://doi.org/10.3390/su11030783

Hurlbert, M. A., & Datta, R. (2022). When the environment is destroyed, you're destroyed: Achieving Indigenous led pipeline justice. *Energy Research & Social Science*, *91*, 102711. https://doi.org/10.1016/j.erss.2022.102711

Huybrechts, B., & Mertens, S. (2014). The Relevance of the Cooperative Model in the Field of Renewable Energy. *Annals of Public and Cooperative Economics*, *85*(2), 193–212. https://doi.org/10.1111/apce.12038

Hydro One Limited. (2021). *Energizing Life for People & Communities—2021 Annual Report*. https://www.hydroone.com:443/investor-relations/2021-annual-report

IESO. (2022). *2022*. https://ieso.ca/Corporate-IESO/Media/Year-End-Data/2022

IESO. (2024a). *2024 Year in Review*. https://www.ieso.ca/en/Corporate-IESO/Media/Year-End-Data

IESO. (2024b). *Annual Planning Outlook*. https://www.ieso.ca/en/ Sector-Participants/Planning-and-Forecasting/Annual-Planning-Outlook

Institut de l'énergie Trottier. (2024). *The State of Energy and GHG Emissions in Canada*. https://iet.polymtl.ca/en/publications/report/canadian-energy-outlook-3rd-edition-first-report

IRENA. (2020). *Rise of renewables in cities – Energy solutions for the urban future*.

Jenkins, K. E. H., Spruit, S., Milchram, C., Höffken, J., & Taebi, B. (2020). Synthesizing value sensitive design, responsible research and innovation, and energy justice: A conceptual review. *Energy Research & Social Science*, *69*, 101727. https://doi.org/10.1016/j.erss.2020.101727

Jenkins, K., McCauley, D., Heffron, R., Stephan, H., & Rehner, R. (2016). Energy justice: A conceptual review. *Energy Research & Social Science*, *11*, 174–182. https://doi.org/10.1016/j.erss.2015.10.004

Joshi, G., & Yenneti, K. (2020). Community solar energy initiatives in India: A pathway for addressing energy poverty and sustainability? *Energy and Buildings*, *210*, 109736. https://doi.org/10.1016/j.enbuild.2019.109736

Kammen, D. M., & Sunter, D. A. (2016). City-integrated renewable energy for urban sustainability. *Science*, *352*(6288), 922–928. https://doi.org/10.1126/science.aad9302

Karanasios, K., & Parker, P. (2017). *Recent Developments in Renewable Energy in Remote Aboriginal Communities, Ontario, Canada*. *16*.

Keirstead, J., & Shah, N. (Eds.). (2013). *Urban Energy Systems: An Integrated Approach*. Routledge. https://doi.org/10.4324/9780203066782

Klein, N. (2015). *This Changes Everything: Capitalism vs. The Climate*. https://www.amazon.ca/This-Changes-Everything-Capitalism-Climate/dp/0307401995

Lazoroska, D., Palm, J., & Bergek, A. (2021). Perceptions of participation and the role of gender for the engagement in solar energy communities in Sweden. *Energy, Sustainability and Society*, *11*(1), 35. https://doi.org/10.1186/s13705-021-00312-6

Lazowski, B., Parker, P., & Rowlands, I. H. (2018). Towards a smart and sustainable residential energy culture: Assessing participant feedback from a long-term smart grid pilot project. *Energy, Sustainability and Society*, *8*(1), 27. https://doi.org/10.1186/s13705-018-0169-9

Lee, J., & Byrne, J. (2019). Expanding the Conceptual and Analytical Basis of Energy Justice: Beyond the Three-Tenet Framework. *Frontiers in Energy Research*, *7*. https://doi.org/10.3389/fenrg.2019.00099

Listo, R. (2018). Gender myths in energy poverty literature: A Critical Discourse Analysis. *Energy Research & Social Science*, *38*, 9–18. https://doi.org/10.1016/j.erss.2018.01.010

MacDougall, S., & Thorn, A. (2025). *Assembling the Future: Powering a healthier, more affordable Ontario*. Pembina Institute. https://www.jstor.org/stable/resrep67837

Madlener, R., & Sunak, Y. (2011). Impacts of urbanization on urban structures and energy demand: What can we learn for urban energy planning and urbanization management? *Sustainable Cities and Society*, *1*(1), 45–53. https://doi.org/10.1016/j.scs.2010.08.006

Maynard, R., & Simpson, L. B. (2022). *Rehearsals for Living*. Yumpu.Com. https://www.yumpu.com/en/document/view/69063957/download-free-pdf-rehearsals-for-living-by-robyn-maynard-leanne-betasamosake-simpson

McMurtry, J. J., & Tarhan, M. D. (2019). Consumer (Co-)Ownership in Renewables in Ontario (Canada). In *Energy Transition* (pp. 507–531). Palgrave Macmillan, Cham. https://doi.org/10.1007/978-3-319-93518-8_22

Mechlenborg, M., & Gram-Hanssen, K. (2020). Gendered homes in theories of practice: A framework for research in residential energy consumption. *ResearchGate*. https://doi.org/10.1016/j.erss.2020.101538

Mejía-Montero, A., Jenkins, K. E. H., Van Der Horst, D., & Lane, M. (2023). An intersectional approach to energy justice: Individual and collective concerns around wind power on Zapotec land. *Energy Research & Social Science*, *98*, 103015. https://doi.org/10.1016/j.erss.2023.103015

Miller, C. A., Iles, A., & Jones, C. F. (2013). The Social Dimensions of Energy Transitions. *Science as Culture*, *22*(2), 135–148. https://doi.org/10.1080/09505431.2013.786989

Ministry of Energy and Mines. (2025a). *Bill 40, Protect Ontario by Securing Affordable Energy for Generations Act, 2025—Legislative Assembly of Ontario*. https://www.ola.org/en/legislative-business/bills/parliament-44/session-1/bill-40

Ministry of Energy and Mines. (2025b, June 15). *Ontario Launches Plan to Secure Energy for Generations*. News.Ontario.Ca. https://news.ontario.ca/en/release/1006043/ontario-launches-plan-to-secure-energy-for-generations?utm_source=chatgpt.com

Mulvihill, P., Winfield, M., & Etcheverry, J. (2013). Strategic environmental assessment and advanced renewable energy in ontario: Moving forward or blowing in the wind? *Journal of Environmental Assessment Policy and Management*, *15*(02), 1340006. https://doi.org/10.1142/S1464333213400061

Natural Resources Canada. (2024, February 4). *Canada Greener Homes Initiative – February 2024 Update*. https://natural-resources.canada.ca/energy-efficiency/home-energy-efficiency/canada-greener-homes-initiative/canada-greener-homes-initiative-february-2024-update

Newell, P. J., Geels, F. W., & Sovacool, B. K. (2022). Navigating tensions between rapid and just low-carbon transitions. *Environmental Research Letters*, *17*(4), 041006. https://doi.org/10.1088/1748-9326/ac622a

Office of the Auditor General of Ontario. (2017). *The Fair Hydro Plan: Concerns about fiscal transparency, accountability and value for money*. https://www.auditor.on.ca/en/content/specialreports/specialreports2017.html

Office of the Premier of Ontario. (2020). *Ontario providing electricity relief to families, small businesses and farms during COVID-19.* News.Ontario.Ca. https://news.ontario.ca/en/release/56451/ontario-providing-electricity-relief-to-families-small-businesses-and-farms-during-covid-19

Ontario Energy Association. (2020). *Ontario energy association supports ontario's expansion of LEAP program*. https://www.newswire.ca/news-releases/ontario-energy-association-supports-ontario-s-expansion-of-leap-program-840907927.html

Ontario Energy Board. (n.d.-a). *Mission and mandate*. Retrieved June 22, 2025, from https://www.oeb.ca/about-oeb/mission-and-mandate

Ontario Energy Board. (n.d.-b). *Overview of energy sector*. Retrieved June 22, 2025, from https://www.oeb.ca/ontarios-energy-sector/overview-energy-sector

Ontario Energy Board. (2015a). *New Program Helps Low-Income Ontarians with Electricity Bills*. https://www.newswire.ca/news-releases/new-program-helps-low-income-ontarians-with-electricity-bills-539445691.html

Ontario Energy Board. (2015b). *OESP & LEAP Program Manual*.

Ontario Energy Board. (2016). *2016-2018 natural gas demand side management evaluation, measurement, and verification (EM&V) plan*.

OPA/IESO. (2013). *Engaging Local Communities in Ontario's Electricity Planning Continuum—Enhancing Regional Electricity Planning and Sitting*.

Paehlke, R. (1997). The Politics of Power: Ontario Hydro and Its Government, 1906–1995Neil B. Freeman Toronto: University of Toronto Press, 1996, pp. xii, 252. *Canadian Journal of Political Science/Revue Canadienne de Science Politique*, *30*(4), 751–752. https://doi.org/10.1017/S0008423900016565

Park, J. J. (2012). Fostering community energy and equal opportunities between communities. *Local Environment*, *17*(4), 387–408. https://doi.org/10.1080/13549839.2012.678321

Parovic, M., & Kljajic, M. (2022). Improvement of metric for quantification and assessment of the energy justice. *Thermal Science*, *26*(3 Part A), 2225–2237. https://doi.org/10.2298/TSCI210527262P

Pearl-Martinez, R., & Stephens, J. C. (2017). Toward a Gender Diverse Workforce in the Renewable Energy Transition. *Sustainability: Science, Practice and Policy*, *12*(1). https://doi.org/10.1080/15487733.2016.11908149

Pellegrini-Masini, G., Pirni, A., & Maran, S. (2020). Energy justice revisited: A critical review on the philosophical and political origins of equality. *Energy Research & Social Science*, *59*, 101310. https://doi.org/10.1016/j.erss.2019.101310

Qudrat-Ullah, H. (2014). Green power in Ontario: A dynamic model-based analysis. *Energy*, *77*, 859–870. https://doi.org/10.1016/j.energy.2014.09.072

Rakshit, R., Shahi ,Chander, Smith ,M. A. (Peggy), & and Cornwell, A. (2019). Energy transition complexities in rural and remote Indigenous communities: A case study of Poplar Hill First Nation in northern Ontario*. *Local Environment*, *24*(9), 809–824. https://doi.org/10.1080/13549839.2019.1648400

Razzaghi Asl, S. (2022). Re-powering the Nature-Intensive Systems: Insights From Linking Nature-Based Solutions and Energy Transition. *Frontiers in Sustainable Cities*, *4*, 860914. https://doi.org/10.3389/frsc.2022.860914

Robinson, C., Simcock, N., & Petrova, S. (2023). Energy justice and gender. In S. Bouzarovski, S. Fuller, & T. Reames (Eds.), *Handbook on Energy Justice* (pp. 188–200). Edward Elgar Publishing. https://doi.org/10.4337/9781839102967.00020

Rosenbloom, D., & Meadowcroft, J. (2014). The journey towards decarbonization: Exploring socio-technical transitions in the electricity sector in the province of Ontario (1885–2013) and potential low-carbon pathways. *Energy Policy*, *65*, 670–679. https://doi.org/10.1016/j.enpol.2013.09.039

Scott, D. N. (2024). *Chapter 6: Environmental Law for a Just Transition*.

Scott, D. N., & Smith, A. A. (2018). “Sacrifice Zones” in the Green Energy Economy: Toward an Environmental Justice Framework. *McGill Law Journal*, *62*(3), 861–898. https://doi.org/10.7202/1042776ar

Scott, J. C. (2020). *Seeing like a state: How certain schemes to improve the human condition have failed* (Veritas paperback edition). Yale University Press.

Shaw, K., Hill, S. D., Boyd, A. D., Monk, L., Reid, J., & Einsiedel, E. F. (2015). Conflicted or constructive? Exploring community responses to new energy developments in Canada. *Energy Research & Social Science*, *8*, 41–51. https://doi.org/10.1016/j.erss.2015.04.003

Simcock, N., & Bouzarovski, S. (2025). A cure-all for energy poverty? Thinking critically about energy advice. *Critical Social Policy*, *45*(1), 49–71. https://doi.org/10.1177/02610183231219185

Simpson, L. (2017). *As we have always done: Indigenous freedom through radical resistance*. University of Minnesota Press.

Songsore, E., & Buzzelli, M. (2016). Ontario's Experience of Wind Energy Development as Seen through the Lens of Human Health and Environmental Justice. *International Journal of Environmental Research and Public Health*, *13*(7), 684. https://doi.org/10.3390/ijerph13070684

Sovacool, B. K., Bergman, N., Hopkins, D., Jenkins, K. E., Hielscher, S., Goldthau, A., & Brossmann, B. (2020). Imagining sustainable energy and mobility transitions: Valence, temporality, and radicalism in 38 visions of a low-carbon future. *Social Studies of Science*, *50*(4), 642–679. https://doi.org/10.1177/0306312720915283

Sovacool, B. K., & Dworkin, M. H. (2015). Energy justice: Conceptual insights and practical applications. *Applied Energy*, *142*, 435–444. https://doi.org/10.1016/j.apenergy.2015.01.002

Sovacool, B. K., Heffron, R. J., McCauley, D., & Goldthau, A. (2016). Energy decisions reframed as justice and ethical concerns. *Nature Energy*, *1*(5), 16024. https://doi.org/10.1038/nenergy.2016.24

Sovacool, B. K., Newell, P., Carley, S., & Fanzo, J. (2022). Equity, technological innovation and sustainable behaviour in a low-carbon future. *Nature Human Behaviour*, *6*(3), 326–337. https://doi.org/10.1038/s41562-021-01257-8

Statistics Canada. (2021, July 27). *New motor vehicle registrations: Quarterly data visualization tool*. https://www150.statcan.gc.ca/n1/pub/71-607-x/71-607-x2021019-eng.htm

Story, P. A., & Lickers, F. H. (1997). Partnership Building for Sustainable Development: A First Nations Perspective from Ontario. *Journal of Sustainable Forestry*, *4*(3–4), 149–162. https://doi.org/10.1300/J091v04n03_14

Sun, Z., Zhang, F., Wang, Y., & Shao, Z. (2023). Literature review and analysis of the social impact of a just energy transition. *Frontiers in Sustainable Food Systems*, *7*, 1119877. https://doi.org/10.3389/fsufs.2023.1119877

Tarhan, D. (2022). Community renewable energy's problematic relationship with social justice: Insights from Ontario. *Local Environment*, *27*(6), 767–783. https://doi.org/10.1080/13549839.2022.2077713

Thomson, I. T. D., Fagan, D., & Speer, S. (2021). Reforming Provincial Energy Planning: Summary and Analysis from Ontario 360's Expert Roundtable. *Ontario 360*. https://on360.ca/policy-papers/reforming-provincial-energy-planning-summary-and-analysis-from-ontario-360s-expert-roundtable/

Ting Du. (2021). How Institutional Factors Affect Renewable Energy Policy—A Case Study of Ontario Feed-In-Tariff Programs. *Journal of US-China Public Administration*, *18*(5). https://doi.org/10.17265/1548-6591/2021.05.003

Tjørring, L. (2016). We forgot half of the population! The significance of gender in Danish energy renovation projects. *Energy Research & Social Science*, *22*, 115–124. https://doi.org/10.1016/j.erss.2016.08.008

Tjørring, L., Jensen, C. L., Hansen, L. G., & Andersen, L. M. (2018). Increasing the flexibility of electricity consumption in private households: Does gender matter? *Energy Policy*, *118*, 9–18. https://doi.org/10.1016/j.enpol.2018.03.006

Union Gas Limited. (2013). *Union Gas to Provide Emergency Heating Relief for Low-Income Families*. https://www.newswire.ca/news-releases/union-gas-to-provide-emergency-heating-relief-for-low-income-families-511915891.html

Wang, X., & Lo, K. (2021). Just transition: A conceptual review. *Energy Research & Social Science*, *82*, 102291. https://doi.org/10.1016/j.erss.2021.102291

Whiteley, A., & Dumbrille, A. (2021). Ontario's Green Energy Policy vs. Social Justice. *Open Journal of Social Sciences*, *09*(01), 447–486. https://doi.org/10.4236/jss.2021.91033

Whiteley, A., Dumbrille, A., & Hirsch, J. (2021). Access to Justice: Recommended Reforms to the Ontario Justice System Using the Green Energy Act as an Example. *Open Journal of Social Sciences*, *09*(01), 1–19. https://doi.org/10.4236/jss.2021.91001

Williams, S., & Doyon, A. (2024). *Cities, Climate and Inequalities – Justice in energy transitions – VRM*. https://www.vrm.ca/en/la-justice-dans-les-transitions-energetiques-2/

Winfield, M. (2020). *(32) Has Ontario made itself an "innovation wasteland" for energy? | LinkedIn*. https://www.linkedin.com/pulse/has-ontario-made-itself-innovation-wasteland-energy-mark-winfield/

Winfield, M., Gibson, R. B., Markvart, T., Gaudreau, K., & Taylor, J. (2010). Implications of sustainability assessment for electricity system design: The case of the Ontario Power Authority's integrated power system plan. *Energy Policy*, *38*(8), 4115–4126. https://doi.org/10.1016/j.enpol.2010.03.038

Winfield, M., & Weiler, S. (2018). Institutional diversity, policy niches, and smart grids: A review of the evolution of Smart Grid policy and practice in Ontario, Canada. *Renewable and Sustainable Energy Reviews*, *82*, 1931–1938. https://doi.org/10.1016/j.rser.2017.06.014

Woods, C. (2017). Development Drowned and Reborn. *Georgia Press*. https://www.ugapress.org/9780820350929/development-drowned-and-reborn/

Wyse, S. M., Das, R. R., Hoicka, C. E., Zhao, Y., & McMaster, M.-L. (2021). Investigating Energy Justice in Demand-Side Low-Carbon Innovations in Ontario. *Frontiers in Sustainable Cities*, *3*, 633122. https://doi.org/10.3389/frsc.2021.633122

Appendix

Appendix A: Ethics Approval

UNIVERSITY OF WATERLOO

Notification of Ethics Clearance to Conduct Research with Human Participants

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Principal Investigator: Mathieu Feagan

Co-Principal Investigator: Daniel Murray

Student investigator: Ayesha Rahaman

File #: 46684

Title: Inclusive Energy Futures: Understanding Social Impacts & Equity Considerations in Ontario's Energy
Sector Transitions

The Human Research Ethics Board is pleased to inform you this study has been reviewed and given ethics clearance.

Initial Approval Date: 10/21/24 (m/d/y)

University of Waterloo Research Ethics Boards are composed in accordance with, and carry out their functions and operate in a manner consistent with, the institution's guidelines for research with human participants, the Tri-Council Policy Statement for the Ethical Conduct for Research Involving Humans (TCPS2 2022), the Ontario Personal Health Information Protection Act (PHIPA), and all laws and regulations of the province of Ontario (as applicable). Additionally, CREB operates in a manner consistent with the International Conference for Harmonization of Technical Requirements for Pharmaceuticals for Human Use (ICH) Guidance E6(R2): Good Clinical Practice , the International Organization for Standardization of Good Clinical Practices (GCP) as set out by ISO 14155 - Clinical investigation of medical devices for human subjects, Part C, Division 5 of the Food and Drug Regulations, Part 4 of the Natural Health Products Regulations, Part 3 of the Medical Devices Regulations. Both Boards are registered with the U.S. Department of Health and Human Services under the Federal Wide Assurance, FWA00021410, and IRB registration number IRB00002419 (HREB) and IRB00007409 (CREB).

Expiry Date: 10/22/25 (m/d/y)

Multi-year research must be renewed at least once every 12 months unless a more frequent review has otherwise been specified. Studies will only be renewed if the renewal report is received and approved before the expiry date. Failure to submit renewal reports will result in the investigators being notified ethics clearance has been suspended and Research Finance being notified the ethics clearance is no longer valid.

Level of review: Delegated Review

Signed on behalf of the Human Research Ethics Board

Karen Pieters, Manager, Research Ethics, karen.pieters@uwaterloo.ca, 519-888-4567, ext. 41495

This above-named study is to be conducted in accordance with the submitted application and the most recently approved versions of all supporting materials.

Documents reviewed and received ethics clearance for use in the study and/or received for information:

file: RecruitmentLetter_version2_20241015.docx

file: Survey Questionnaire_version3_20241001.docx

file: WrittenConsentForm__version4_20241021.docx

file: InformationLetter_version2_20241017.docx

file: AppreciationLetter_version1_20240906.docx

Approved Protocol Version 4 in Research Ethics System

This is an official document. Retain for your files.

You are responsible for obtaining any additional institutional approvals that might be required to complete this study.

Appendix B: Survey Questionnaire

Demographic Information

1. How many years of experience do you have in the energy sector?

- Less than 5 years
- 5-10 years
- 10-20 years
- More than 20 years

2. Which sector best describes your area of expertise?

- Nuclear Energy
- Renewable Energy
- Policy and Regulation
- Social Justice and Equity
- Community Engagement
- Other (Please specify)

Section 1: Energy Transitions in Ontario

3. In your view, what are the most pressing challenges that Ontario's energy sector will face over the next 5 years? Please consider technological, economic, social, political, and environmental factors.

- (Open-ended)

4. How do you think Ontario's energy sector should be transformed to address these challenges? What specific steps, policies, or strategies would you recommend for a successful and sustainable transition?

- (Open-ended)

Energy Transition

Energy transition refers to the significant shift from one energy system to another, such as moving from fossil fuels to electricity as the dominant energy source. Energy transitions involve changes in energy infrastructure, prices, and the way energy is produced and consumed. This process requires both technological advancements as well as urban planning and policy changes. Energy transitions may aim to create more sustainable systems, but they also raise important questions about fairness and equity. For example, how can we ensure that these changes benefit everyone, including the communities that are or have been marginalized?

Energy Justice

Energy justice focuses on ensuring that everyone is treated fairly when it comes to energy production, distribution, and use. It looks at the fair distribution of energy's benefits and burdens, making sure that everyone has access to energy services and is treated equitably in decision-making. Energy justice also acknowledges both past injustices, such as the impact of energy projects on certain communities, and future ones, like the concerns of future generations.

Section 2: Equity Considerations in Ontario's Energy Sector Transformation

5. What do you believe are the most critical equity considerations that should be addressed in Ontario's energy sector transformation (moving from fossil fuels to electricity as the dominant energy source)?

- (Open-ended)

6. In your opinion, how well are equity considerations currently integrated into Ontario's energy policies and decision-making processes? Please explain the reason for your rating.

- [Likert scale: 1 (Not at all) to 5 (Very well)]
- [Please explain your rating.] [Open text]

7. Which groups do you believe are most at risk of being overlooked in Ontario's energy sector transformation? Choose all that apply.

- [Multiple choice: Indigenous communities, Low-income households, Renters, Rural communities, Urban communities, Other (please specify)]
- [Please explain your choice(s).] [Open text]

Section 3: Policy and Decision-Making Processes

8. What does energy justice (ensuring fair access, distribution, and decision-making in energy, addressing past and future inequalities) mean to you in the context of Ontario's energy sector? How did you develop your insight on the concept based on your expertise?

- (Open-ended)

9. How do you think procedural justice (ensuring fair decision-making processes) can be improved in Ontario's energy policies?

- (Open-ended)

10. How can distributive justice (ensuring a fair distribution of benefits and burdens) be better addressed in Ontario's energy policies?

- (Open-ended)

11. What improvements could be made to ensure recognition justice (acknowledging and respecting diverse identities) is more fully incorporated into Ontario's energy policies?

- (Open-ended)

12. In what ways do you think restorative justice (correcting past injustices) can be strengthened in Ontario's energy policies?

- (Open-ended)

13. What indicators would you consider essential for evaluating energy justice in Ontario's energy policies?

- Indicator 1;
- Indicator 2;
- Indicator 3;
- Indicator 4;
- Indicator 5;

14. How can these indicators be practically applied in policy and decision-making processes?

- (Open-ended)

15. As listed below, some indicators for energy justice do exist in the literature. Please indicate your level of agreement with these indicators and explain the reasons for your rating.

1. Availability
    - [Likert scale: 1 (Strongly Disagree) to 5 (Strongly Agree)]
    - [Please explain your rating.]
2. Affordability
    - [Likert scale: 1 (Strongly Disagree) to 5 (Strongly Agree)]
    - [Please explain your rating.]
3. Information
    - [Likert scale: 1 (Strongly Disagree) to 5 (Strongly Agree)]
    - [Please explain your rating.]
4. Involvement
    - [Likert scale: 1 (Strongly Disagree) to 5 (Strongly Agree)]
    - [Please explain your rating.]

Section 4: Renewable Energy Integration

16. How important is it to include local community perspectives when making energy policy decisions regarding renewable energy projects? Please explain the reason for your rating.

- [Likert scale: 1 (Not important) to 5 (Highly important)]
- [Please explain your rating.] [Open text]

17. In your opinion, how can the integration of renewable energy into Ontario's energy mix be managed or designed better to address equity issues and ensure equitable outcomes for all?

- (Open-ended)

Section 5: General Feedback

18. Are there any other significant barriers (that you already haven't touched upon above) to achieving equity in Ontario's energy sector transformation? Or do you have any additional comments or suggestions regarding the focus of this study?

- (Open-ended)