Toward Envisioning and Implementing Just Transitions to a Post-Carbon Society in Canada

Knowledge Synthesis Grant: Living Within the Earth's Carrying Capacity
Final Report

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Executive Summary

Background: The issue

The just transition concept emerged from labor and trade unions' concerns about jobs during industrial disruptions (Morena et al., 2018; Newell & Mulvaney, 2013). Recently, just transitions have been associated with a move away from fossil fuels. Just transitions are particularly critical in countries such as Canada, where the fossil fuel sector accounts for a significant portion of the national economy. At the same time, Canada is experiencing climate change firsthand and in real time. To further complicate the challenges in front of us, the ongoing COVID-19 pandemic has emphasized the urgency of adopting and formulating a just transition policy in Canada and beyond.

Objectives

This knowledge synthesis report contributes to the transdisciplinary and intersectoral envisioning and implementation of a just post-carbon society in Canada. To this end, the project focuses on three areas:

1) Synthesizing the existing knowledge (academic and grey literature) about just transitions and identifying research gaps and future research avenues;

2) Searching and analyzing the ongoing just transition policies and initiatives undertaken in Canada and internationally; and

3) Outlining knowledge gaps and developing policy recommendations that can be undertaken in order to move forward on an equitable transition path, given Canada's political, social, and economic realities, including reconciliation with its Indigenous peoples.

Methodology

Given just transitions literature's rapid recent growth, we performed an open-ended, iterative, and multi-tiered literature review process to grasp the main themes and tendencies in the literature. In order to begin a more equitable conversation between Western scholarship and Indigenous knowledge systems, we involved an Indigenous collaborator in the design and execution of the project, and conducted an Elder consultation to receive guidance on our questions and our colonial blind spots.

Certain limitations of this study need to be acknowledged. Because of the remarkable growth rate of the just transitions literature in the past year, it is possible that some of the latest studies are not included in this review due to lags in indexing or simply the timing of publication. It is also possible that the use of "just transition" as a search term did not yield studies that speak to this topic but use analogous terms. Additionally, we reviewed only English-language literature; studies and reports produced in other languages are not included in this review. Lastly, the COVID-19 pandemic created additional challenges while conducting this study. Most significantly, it altered our plans to conduct Elder consultations and implement knowledge dissemination activities.

Results

- On the theoretical front, much attention has been paid to establishing conceptual connections between just transitions and the ideas advanced in environmental, climate, and energy justice literature. However, this attention seems to be unevenly distributed.

More attention needs to be paid to recognition-related questions of justice and considerations about multispecies justice.

● On the empirical front, there seems to be uneven sectoral and geographical coverage of the just transitions literature. It is important to expand just transitions scholarship to better understand and analyze the context-dependent nature of just transitions, and the local and regional nuances impacting just transitions processes. Sectoral coverage should go beyond the energy sector and take into account the implications that decarbonization efforts will have on other sectors, such as mining.

● The findings of this report underscore the importance of engaging various actors in just transition processes. We particularly highlight the role that labor unions and local communities can play in developing decarbonization initiatives, industry diversification plans, and just transition policies that are acceptable to and supported by those who formerly depended upon fossil fuel extraction for employment and tax revenues.

● We identified five broad types of policy interventions for just transitions: targeted industry goals/shifts, employment/assistance for workers and industry replacement, fossil fuel phaseout, holistic/whole-system transformation, and Green New Deal policies. We conclude that policy approaches to just transitions tend to be top-down, and derived at the national or (at most) regional level, and that a whole-system or holistic approach that will integrate bottom-up and cross-system approaches and take into account anti-racist, decolonial/reconciliation-informed, gendered, and environmental lenses is needed and largely absent.

● Our findings show that across Canada there is discontinuity between individual provincial just transition agendas. These agendas will continue to change as new governments are elected and power shifts occur in the provinces. Therefore, as just transitions are long-term processes, any plan must be insulated from shifts in government priorities as well as changes in government. Given the scope and importance of the problem, a broader, national-level conversation is needed to develop key directions and priorities for just transitions. This work can be tied to ongoing policy initiatives such as the Canadian Climate Accountability Act. In this conversation it is critical to incorporate Indigenous perspectives as full participants throughout any process and incorporate reconciliation goals with those of just transitions.

Key messages

● The concept and practice of just transition have enjoyed remarkable attention in the past few years, especially during 2020.

● There is a need to expand the scope of the scholarship and policy in order to more comprehensively grasp the scale and complexity of just transition processes. Therefore, more work needs to be done—by scholars, policymakers, and practitioners—to make sure that energy transitions do not result in the decarbonized alternatives of unequal and unjust energy systems.

1. Introduction

As we witness the warmest years on record and unprecedented fires, floods, and hurricanes around the globe, the unfolding climate crisis has become obvious, as has the need for a structural, system-wide transition to a post-carbon society (Roberts et al., 2018). Scholars studying sustainability transitions—multi-actor, multi-scale, co-evolutionary processes leading toward a more sustainable developmental pathway—have explored various facets of this large-scale structural change (Köhler et al., 2019). Second-, third-, and fourth-order effects on communities experiencing a foundational shift in economic relationships—including how welfare changes are distributed—are recognized as central tenets of sustainability transitions processes (Geels et al., 2019; Jenkins et al., 2018; Swilling & Annecke, 2012). These distributional, procedural, and relational considerations fall under the umbrella of *just transitions*, a cluster of processes that take into account intersectoral elements and intergenerational effects of a transition from one set of economic relationships to another (McCauley & Heffron, 2018; Newell & Mulvaney, 2013).

Justice is an important part of sustainability transitions for three reasons. First, the movement toward decarbonization should not replicate or exacerbate existing structural inequalities (Newell & Mulvaney, 2013). Second, transitioning to a post-carbon society is a disruptive, complex change that involves overhauling the infrastructural, institutional, and cultural status quo, and may work differently in different places around the globe. The shift from low-cost energy, which has underpinned much of our economic growth in the past two centuries, means any disruption will be felt throughout the economy. Addressing vulnerabilities exacerbated by transition processes is therefore important in moving toward an equitable post-carbon society (Patterson et al., 2018). Third, failing to account for the equity and justice dimensions of decarbonization may provide fodder for criticism and attack from "such pro-status quo actors as fossil fuel companies who exploit equity concerns to generate political opposition to action" (Klinsky et al., 2017, p. 171). Therefore, to be "democratically and ethically defensible" (Patterson et al., 2018, p. 2), any transition process must consider justice and equity as its central elements.

The just transition concept emerged from labor and trade unions' concerns about jobs during industrial disruptions (Morena et al., 2018; Newell & Mulvaney, 2013). Recently, just transitions have been associated with a move away from fossil fuels. In 2015 the International Labour Organization adopted "Guidelines for a Just Transition Towards Environmentally Sustainable Economies and Societies for All," the 2015 Paris Agreement recognized the "the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities," and in 2018 the Solidarity and Just Transition Silesia Declaration was signed at the Katowice Summit (ILO, 2016; *Just Transition Declaration*, 2018; *The Paris Agreement / UNFCCC*, 2019). Just transition is particularly critical in countries such as Canada, where the fossil fuel sector accounts for a significant portion of the national economy. At the same time, Canada is experiencing climate change firsthand. For example, it is projected that future warming in Canada will "increase at roughly double the global mean rate" (Zhang et al., 2019, p. 139). For Canada, the need for just energy transitions is urgent.

To further complicate the challenges in front of us, the ongoing COVID-19 pandemic has emphasized the urgency of adopting and formulating a just transition policy in Canada and beyond. The COVID-19 pandemic has exposed societal fragilities globally and raised fundamental questions about the sustainability of our lifestyles in the West (Botzen et al., 2021). Amid the pandemic, numerous countries, including Canada, have noted fault lines in their

current social service and energy sectors (Black, 2020), and emphasised the need to build back better (Privy Council Office, 2020). Effectively addressing these fragilities requires a holistic perspective that will integrate sustainability and justice objectives as we move forward (Newell & Dale, 2020). Recovery packages can provide economic support in the short term while including plans for long-term effects such as decarbonization and digitalization (Lidskog et al., 2020). However, poorly thought out, poorly implemented, or even simply short-term-focused recovery packages may lock us in a fossil fuel system, which may be difficult to escape (Hepburn et al., 2020) and worsen inequality in society.

1.1 Research objectives

This knowledge synthesis report contributes to the transdisciplinary and intersectoral envisioning and implementation of a just post-carbon society in Canada. To this end, the project focuses on three areas:

1) Synthesizing the existing knowledge (academic and grey literature) about just transitions and identifying research gaps and future research avenues;

2) Searching and analyzing the ongoing just transition policies and initiatives undertaken in Canada and internationally; and

3) Outlining knowledge gaps and developing policy recommendations that can be undertaken in order to move forward on an equitable transition path, given Canada's political, social, and economic realities, including reconciliation with its Indigenous peoples.

1.2 Just transitions in Canada

In Canada just transitions concerns mainly focus on provincial/territorial economies and individual communities affected by the mandated carbon pricing and the phasing out of coal-fired electricity by 2030. Federal-level policies imply the closure of coal-fired power plants and require Canadians to switch to alternative energy sources or adopt carbon sequestration technologies that reduce emissions (Mertins-Kirkwood & Deshpande, 2019). Since 2007 various provinces and municipalities as well as the federal government have made numerous decisions that led to the transition away from coal-fired power generation (Hussey & Jackson, 2019). In Ontario the main factors that caused the transition were the potential impacts that coal-fired power generation had on public health, climate change, and the environment. This led Ontario to phase out all coal-fired power plants by 2014 (Harris et al., 2015).

As a first step in fulfilling Canada's climate change commitments made under the Paris Agreement, the First Ministers of Canada issued the Vancouver Declaration on Clean Growth and Climate Change on March 3, 2016. The declaration recognized the need to reduce greenhouse gas (GHG) emissions while promoting clean economic growth and job creation across the country (Intergovernmental Relations Secretariat, British Columbia, 2016). On April 22, 2016, the Canadian government launched the "Let's Talk Climate Action" website to gather comments and ideas from Canadians on how Canada should address climate change. The launch of the website was combined with clean growth and climate change consultations by governments and working groups to be held across Canada (Environment and Climate Change. Government of Canada, 2020).

The same year saw the release of the Pan-Canadian Clean Growth and Climate Change Framework. The framework outlines a plan for economic development while reducing greenhouse gas emissions, including support for research, the export of clean energy

technologies, and hundreds of millions of dollars pledged for the development and deployment of clean technology (Environment and Climate Change. Government of Canada, 2020).

In 2018 the Government of Canada launched the Task Force on Just Transition for Canadian Coal Power Workers and Communities (Environment and Climate Change. Government of Canada, 2019). This working group (composed of 11 representatives from various sectors) was established to provide the government with recommendations on how to implement a just transition framework to support the Canadian coal community and workers throughout Canada. In its founding year, the task force traveled to various coal communities in Alberta, Saskatchewan, New Brunswick, and Nova Scotia. The task force members conducted interviews in 15 affected communities, held eight public engagement sessions, toured five generating stations, and visited two mines and a shipping port, meeting with various stakeholders. As a result, the task force developed 10 recommendations for the federal government to pursue just transitions (Environment and Climate Change. Government of Canada, 2019).

On June 21, 2018, the federal government instituted the Greenhouse Gas Pollution Pricing Act (GGPPA), colloquially known as the Carbon Tax. This tax has been contested by several provinces via court cases against the federal government (King et al., 2019).

On September 23, 2020, in the Speech from the Throne, Governor General Julie Payette pointed out that COVID-19 had exposed the vulnerabilities in our societies (Privy Council Office, 2020). Payette outlined two distinct needs: to help Canadians in the short term by supporting people and businesses during the pandemic, and to build back Canada better, through a sustainable approach for future generations. Payette outlined that the "Government will bring forward a plan to exceed Canada's 2030 climate goal...and will legislate Canada's goal of net-zero emissions by 2050". She also acknowledged the need for the government to address systemic racism, and to accelerate the pace of reconciliation with Indigenous peoples (Privy Council Office, 2020). In a recent development, the Government of Canada launched an independent net-zero advisory body consisting of 14 experts. Created as a part of the proposed Canadian Net-Zero Emissions Accountability Act, the advisory body will "provide the Government of Canada with advice on the best pathways to achieving net-zero emissions by 2050" (Environment and Climate Change. Government of Canada, 2021).

Each province in Canada has its own policy considerations when trying to reduce greenhouse gas emissions. As coal-fired electricity is phased out nationwide, each province is implementing different procedures to ensure compliance; however, not all provinces explicitly employ a just transitions lens in their environmental plans, nor do they all fully support the phaseout of coal and/or other fossil fuels. A more general discussion about policy approaches to just transitions is presented in Section 3.2.

2. Methodology
2.1 An iterative approach to an exponentially growing topic

To grasp a concept like just transition, we needed a relatively open-ended, iterative approach, as the breadth and depth of the literature (both academic and non-academic) grow as we speak. Interest in the subject, as well as emerging critiques, pushed aside more limited, linear methods in favor of a multi-tiered group effort. First, to establish the literature's roots and parameters, we conducted a systematic literature review of the published English-language academic literature and publicly available grey literature focused explicitly on "just transitions." To do this, we combined a traditional academic literature database (Scopus) with a broader web-based search engine (Google Scholar) to identify a breadth of peer-reviewed literature as well as available relevant grey literature and governmental reports that explicitly discussed "just transition." These results were codified in a matrix to facilitate analysis and theme development. However, one key characteristic of "just transition"—its current rapid growth—demanded a more open-ended approach.

Ultimately, based on these iterative searches, we compiled a matrix peer-reviewed academic papers, grey literature sources, intergovernmental agency reports, governmental reports/announcements/policy documents, and sources produced by media outlets (See the matrix here) (Garrard, 2017). This list represents a strong exponential growth curve in literature on just transitions, which required a modified approach to the traditional literature review.

To capture the evolving state of the academic literature, we performed an ellipses-style search of academic publications using Scopus. First, we searched the term "just transitions" in keywords, abstracts, and/or titles in September 2020, codified the results in a matrix, and explored these results for emergent themes and gaps. Then we performed the same search again in December 2020. This latter search revealed significantly more results than the September 2020 search, including 91 relevant articles (from a total result of 201), 47 of which were published in 2020. Ergo, more than 40% of our total list of relevant academic literature was published within the year we began our study. This is truly an emergent field, but it seems to be emerging with strength.

This second set of 91 articles was entered into the matrix and further informed theme development. While growth over time is to be expected in a healthy academic field of inquiry, the rate of growth points to a rapid proliferation of the academic literature on just transitions in the past year, and the need for a synthesis such as ours to be humble and nimble in response to a topic in flux. Once codified, we performed a qualitative content analysis on the abstracts to identify and cluster thematic categories and overarching trends. The latter included questions of sectoral foci, geographical coverage, and method and evidence employed. The themes identified through this process are discussed in greater detail in Section 3.

Study limitations. Given the remarkable growth rate of the just transitions literature in the past year, it is possible that some of the latest studies are missing from this review due to lags in indexing or simply the timing of publication. It is also possible that the use of "just transition" as a search term did not yield studies that speak to this topic but use analogous terms; this seems particularly likely for earlier literature. Additionally, we reviewed only English-language literature and studies; reports produced in other languages are not included in this review. Lastly, the COVID-19 pandemic created additional challenges while conducting this study. Most significantly, it altered our plans to conduct Elder consultations, which we discuss in more detail next, and knowledge dissemination activities. Notwithstanding these limitations, we hope that

our review grasps the major tendencies and gaps in the current literature, and contributes to advancing this topic in academia and in practice.

2.2 Elder consultation

Our original plan was to meet with Elders in the Treaty 7 area (at least) at the beginning of our project to receive guidance on our questions and our colonial blind spots. However, this project coincided closely with the COVID-19 lockdowns, and collectively we decided it was unsafe to engage in traditional face-to-face consultation, especially as Elders are at high risk of infection and serious illness. Additionally, it took several months for many research offices to approve new, COVID-safe protocols for Elder consultation that would be consistent with TCPS 2 (The Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans) expectations as well as our less formal, but no less important, commitment to fair and reciprocal relations.

Therefore, we shifted to sharing our early results with two Blackfoot (Siksika Nation) Elders with whom we had a previous relationship and who were able to effectively navigate online engagement. This involved three meetings: The purpose of the first was to inform them of the project and gauge their interest and willingness to participate. The second was a 90-minute facilitated discussion about our report and what they felt was missing or needed more emphasis, and simply what they wanted to discuss in the context of just transitions. Lastly, the notes and ultimate written piece were both shared with the Elders for their feedback and corrections. The final version included in this report represents their contribution. A more fulsome discussion of the content and nature of this exchange is included in Section 3.6.2.

While this falls radically short of ideal or even adequate consultation, we feel this process added significantly to this report, and hope sincerely to expand and enrich these relationships and exchanges going forward with any future research.

2.3 Writing the report - Concentric rings

While the themes we uncovered ultimately informed much of this report, this was not a strictly linear process. Writing occurred in three distinct, somewhat expanding stages. First, we developed draft report elements individually informed by the themes we identified in the matrix, as well as a general history of the just transition concept, as both a driver of policy and a subject of study. Second, we shared these short pieces with the small research team to help us generate and germinate key findings and recommendations across the themes. Third, we shared both these themes and emergent key findings with wider collaborators on the project as well as with Elders (see previous section) for their feedback and comments. These comments were then incorporated into the final report, and are detailed below.

3. Results

3.1 The idea of just transitions in practice and in scholarship

Just transitions as a concept may still suffer from fuzzy edges in policy and academic circles: yet decades of research, activism and practice may help clarify this fuzziness, or at least identify where we need to focus future attention. In this section we discuss the origins of the idea of just transition and its further development, especially in scholarly discourse. We specifically focus on just transition frameworks that draw on the conceptualizations of justice in environmental justice literature.

3.1.1. The origins of the just transition concept

The genesis of the just transition concept is closely associated with the work of labor unions. During the 1970s, amid the Campaign for Nuclear Disarmament and associated calls for a general move away from nuclear power, fears grew among labor unions of potential massive layoffs and unemployment ("'Just Transition' - Just What Is It?," 2016; Mazzochi, 1993). One of the main contributors to the concept of just transition was Tony Mazzochi (International Labour Organization, 2016; "'Just Transition' - Just What Is It?," 2016), the labor and environmental leader of the Oil, Chemical and Atomic Workers Union (OCAW). Mazzochi represented atomic workers and was aware that disarmament after the Cold War could result in job loss for many atomic workers ("'Just Transition' - Just What Is It?," 2016). A visionary as well as a Second World War veteran, Mazzochi took his idea from the GI Bill of Rights. The GI Bill, initiated after the Second World War, provided veterans with up to four years of tuition and a living wage in an attempt to boost the US economy and prevent mass structural unemployment and economic dislocation after the war ("'Just Transition' - Just What Is It?," 2016; Leopold, 2007; Mazzochi, 1993). Mazzochi proposed that workers who lost their jobs owing to disarmament should receive similar support (Leopold, 2007, p. 415).

In the late 1980s and early 1990s scientific evidence became overwhelming that the use of fossil fuels caused global warming and environmental degradation. Scientists and environmentalists also stressed the dangers of using chemical pesticides. It was during this time that the Environmental Protection Agency (EPA) forced the company Velsicol to suspend sales of chlordane and heptachlor, both toxic pesticides (Office of Scientific and Technical Information, 1988). This decision resulted in Velsicol closing its operations in Marshall, Illinois, and laying off all its hourly wage employees. The EPA listed the plant and property as a "Superfund Site," ordering that more than $10 million be spent on cleaning up the site, which had been in operation since the mid-1930s (Office of Scientific and Technical Information, 1988). However, this did not include compensation for the laid-off workers. Mazzochi questioned why there was a "fund for dirt" (toxic cleanup) but not one to support the workers who had lost their jobs due to environmental policies (Mazzochi, 1993).

Mazzochi and other unionists acknowledged that the industries whose members they represented were causing severe environmental degradation and advocated for change aimed at addressing health and safety issues, employment, and the preservation of the natural environment (McCauley & Heffron, 2018). Mazzochi advocated for a "Superfund for Workers" based on the premise that workers should be compensated during the transition from one kind of economic activity to another. The "Superfund for Workers" would guarantee full wages and benefits to employees who were displaced by environmental protection policies or accidents, until they obtained higher education or could secure comparable employment (International Labour

Organization, 2016; Mazzochi, 1993). According to Les Leopold, a close friend and protégé of Mazzochi, environmentalists felt the term "superfund" held too many negative connotations, and it was changed to "just transition" (Leopold, 2007, p. 415).

In 1996 Les Leopold, then executive director of the Labor Institute, and Bob Wages, the president of the Oil, Chemical and Atomic Workers Union, began to convene representatives from organized labor and frontline communities that were experiencing environmental degradation to discuss what a just transition could look like from the perspective of both of these groups (Climate Justice Alliance, n.d.; "'Just Transition' - Just What Is It?," 2016). As a result of these efforts, the Just Transitions Alliance was established in 1997 ("'Just Transition' - Just What Is It?," 2016; Young, 2003).

During the early 2000s the term "just transition" started appearing in International Confederation of Free Trade Unions (ITUC) publications, which represents over 200 million unionized workers globally in more than 160 countries and territories (International Trade Union Confederation, n.d.; Rosemberg, 2010). For climate change mitigation plans to succeed, scholars, environmentalists, and labor and trade unions argued that a holistic and collaborative approach was needed that focused on inequalities, jobs, poverty, and economic growth (ILO, 2016). The terms "job creation" and "climate change" could no longer be mutually exclusive.

In December 2007 the ITUC released a statement for the United Nations Framework Convention on Climate Change (UNFCCC) conference in Bali, Indonesia, indicating the need for collaboration between climate change policy and the economy. The trade unions called for all countries to engage in a stronger commitment to reduce greenhouse gas (GHG) emissions, along with a commitment to aid and protect the most vulnerable (International Trade Union Confederation (ITUC), 2007). At the second ITUC Congress, held in Vancouver, Canada, in 2010, the concept of just transition was adopted as the basis for fighting climate change (International Trade Union Confederation (ITUC), 2010).

In the preamble to the 2015 Paris Climate Agreement, the ITUC mobilized heavily around climate change, asserting that "a transition towards a zero-carbon world cannot leave workers behind and the time for a Just Transition has come" (International Trade Union Confederation (ITUC), 2015a). Prior to and during the 2015 United Nations Climate Change Conference (COP21), the trade unions distributed their demands for the Paris Climate Agreement. Business coalitions and civil society representatives signed a petition issued by the ITUC calling for dialogue on a just transition, which was unveiled by the ITUC the day before COP21 began (International Trade Union Confederation (ITUC), 2015b). The Unions presented their petition as a list of demands, including #3, which stated: "The Paris Climate agreement, in its OPERATIONAL section, must include a commitment to 'Just Transition' measures. This is essential to support the challenge of industrial transformation in all sectors, in particular jobs and livelihoods for workers in emission-intensive industries" (International Trade Union Confederation (ITUC), 2015b). The ITUC's initiative succeeded, and "just transition" was recognized in the Paris Agreement (International Trade Union Confederation (ITUC), 2018).

In 2018 national government representatives signed the Silesian Declaration on Unity and Just Transition at the United Nations Climate Change Conference (COP 24) in Katowice, Poland. The result of the Katowice meeting was the creation of a complex package containing operational guidance on the implementation of the Paris Agreement and the importance of a just transition. This political support was intended to assist in mainstreaming climate change policies and to garner social approval for future transitions (United Nations. Climate Change, n.d.).

3.1.2 The just transition concept and just transition frameworks

Alongside the proliferation of the just transitions literature in the past several years, and parallel to the growing interest in politics and labor discussions detailed earlier, scholarly discussions of the theoretical underpinning of the just transition concept have also expanded. The central aim of this conversation is the exploration of the concept of justice understood as "the fair, equitable, and respectful treatment of humans, other species, and the environment" (Williams & Doyon, 2019, p. 145), and the advancement of justice-based frameworks. The major focus of the scholars engaged in these conversations has been the literature on environmental justice, climate justice, and energy justice (Bennett et al., 2019; Carley & Konisky, 2020; Martin et al., 2020; Newell & Mulvaney, 2013; Williams & Doyon, 2019). For example, Hughes and Hoffmann (2020, p. 2) draw on the environmental and climate justice scholarship to develop the concept of just urban transition (JUT) understood as "the fusion of climate action and justice concerns at the urban scale". The authors conclude that a pathway toward a JUT should involve three principles: ensuring that the lives of historically oppressed peoples are protected from the potential adverse effects of an economic transition, ensuring that decision-making processes are inclusive and engaging for all residents, and ensuring that new governing initiatives acknowledge and attempt to correct "structural inequalities and prior injustices" (Hughes & Hoffmann, 2020, p. 7).

Several inquiries focusing on energy transitions proposed analytical frameworks to address justice considerations in these processes. Among these studies, the most common approach adopts the trivalent notion of justice, consisting of distributive, procedural, and recognition accounts of justice (Bennett et al., 2019; Williams & Doyon, 2019). This can be explained by the fact that scholars probing into the justice dimension of energy transitions have closely explored the environmental justice literature, where the three-dimensional view of justice claims has been prominent. In this three-dimensional conceptualization of justice, distributive justice is concerned with the distribution of environmental harms across society (Bullard, 1983; McGurty, 1997; Walker, 2012). Procedural environmental justice implies the perceived fairness of decision-making procedures and processes. Last, recognition, or rather the lack of it, relates to the cultural and institutional processes of disrespect and stigmatization of certain groups (defined by ethnicity, religion, race, gender, sexual orientation, etc.), which lead to unequal patterns of recognition across society (Walker, 2012).

Williams and Doyon's framework (2019, p. 150) integrates how different bodies of literature address distributive, procedural, and recognition accounts of justice, and proposes key questions that emerge around these three tenets. In Table 1 we present these questions, as we find that not only do they propose specific avenues for research, but also they illustrate the complexity and breadth of the justice-related concerns of energy transitions.

Table 1. Key questions about justice and system transitions (Williams and Doyon, 2019, p. 150)

Distributive justice	Procedural justice	Recognition justice
Where and how are the costs and benefits of the transition being distributed?	Who is part of the decision-making process, and in defining "just" and "transition"?	How is recognition, misrecognition, or non-recognition treated?
What scales (e.g., jurisdictional, spatial, and temporal) are used to assess impacts and benefits?	Do all stakeholders have adequate capabilities to participate? If not, what tools or techniques are being implemented to engage a wider set	What cultural institutional processes, legacies, or existing inequalities are present (e.g., the role of colonial legacy and relationships with Indigenous

Distributive justice	Procedural justice	Recognition justice
Are actions reactions to mitigating impacts of events, or proactive planning for future benefits of the transition? What is the scope of analysis (e.g., pilot project, social innovation lab, or whole system)? Are the human rights of affected peoples being respected?	of stakeholders? How are individuals' values and motivations being integrated? How are non-human actors engaged in dialogue? How are future generations engaged in dialogue? What power asymmetries exist within different processes (e.g., financial, political, structural) and how are they addressed? What opportunities are there for resistance to dominant political and economic (infra)structures? What happens when there are unresolved disputes or asserted violations of human rights? How are communities impacted by your research engaged in collaboratively developing research goals?	peoples)? How are minority or marginalized worldviews, knowledges, and values recognized and integrated? How are conflicting knowledges and values consolidated or addressed? How are multiple overlapping identities (intersectionality) recognized? How are costs and benefits identified (i.e., through different worldviews, knowledges and values)?

While drawing on the trivalent notion of justice, scholars have also expanded the scope of just transitions. For example, Delina and Sovacool (2018) proposed a justice-based framework that, similar to those based on the three tenets of justice, includes the considerations of due and transparent process and the importance of respect. It is also broader in its scope, considering, among others, questions of energy availability and affordability, and the issue of sustainability. In another case, the just transition framework proposed by Heffron and McCauley (2018) draws on legal geography and, in addition to the three tenets of justice, incorporates considerations of space, time, and the universal forms of justice (recognition and cosmopolitanism). In addition to distributive and procedural justice considerations, McCauley and Heffron (2018, p. 5) offer to incorporate the restorative element, which stems from legal studies and aims "to repair the harm that has been done to an individual, rather than simply focused upon punishing the offender."

Ciplet and Harrison (2020, p. 2) also draw on the three tenets of justice, but their aim is to outline "potential areas of conflict, tensions, and tradeoffs within just transitions planning and activism." In their analysis the authors identify three types of tensions: "sustainability-inclusivity," which draws on procedural justice; "sustainability-recognition," which is based on recognition justice; and "sustainability-equity," which draws on distributive justice concerns. For each, Ciplet and Harrison (2020) conceptualize four types of outcomes, including the just transition outcome, in which sustainability- and justice-related goals are both met.

Muttitt and Kartha (2020) adopt a somewhat different conceptualization, drawing on three equity approaches: economic efficiency, meeting development needs, and effort sharing. The authors' (Muttitt & Kartha, 2020) scope is global, and they mainly discuss the differences among the countries. Based on their analysis, the authors propose five principles on how to limit fossil fuel extraction equitably (Muttitt & Kartha, 2020, p. 10):

(1) Phase down global extraction at a pace consistent with limiting warming to 1.5°C;

(2) Enable a just transition for workers and communities;

(3) Curb extraction consistent with environmental justice;

(4) Reduce extraction fastest where social costs of transition are least—in those economies least dependent on extraction and with greatest resources to absorb the transition;

(5) Share transition costs fairly, according to ability to bear those costs.

Since its first framing, much progress has been made in addressing some of the critiques of the just transition scholarship, such as the lack of clarity to the concept of just transition (Snell, 2018), and the need for a greater recognition of power and politics in energy transition scholarship (Healy & Barry, 2017). Yet gaps remain, which we outline in more detail in the final sections of this report.

3.2 Just transition policy trends

The policy landscape of just transitions is diverse and rapidly growing. While conducting a more nuanced analysis of various policy interventions and practices is beyond the scope of this review, in this section we focus on the main sectoral and geographical trends as well as the main policy tendencies that were revealed during the literature review.

Table 2 clusters studies based on the industrial sector that they target and their geographical focus. Two conclusions can be drawn from this table: most of the consulted studies focus on the coal industry and on the OECD countries. It should be noted that both of these trends are characteristic of the just transitions literature more generally, and we will discuss the implications of these findings in the final sections of the report.

Table 2. Industrial sectors and just transitions policy and practice

Industrial sector	References (countries refer to the geographic focus of the study)
Coal	(Harrahill & Douglas, 2019) (Germany, Canada, Australia) (Sanz-Hernández, 2020) (Spain) (Fleming-Muñoz et al., 2020; Snell, 2018; Weller, 2019) (Australia) (Baran et al., 2020; Brauers & Oei, 2020) (Poland) (Oei et al., 2020) (Germany) (He et al., 2020) (China) (Pai, Zerriffi, et al., 2020) (China, India, US, Australia) (Roemer & Haggerty, 2021) (US) (Hussey & Jackson, 2019)
Electricity	(Sovacool et al., 2019) (UK)
Home heating	(Kelly et al., 2020) (Ireland)
Nuclear power	(Sovacool et al., 2019, 2021) (France)

Industrial sector	References (countries refer to the geographic focus of the study)
Solar energy	(Sovacool et al., 2019) (Germany)
E-waste	(Sovacool et al., 2021) (Ghana)
Mining	(Sovacool et al., 2021) (DRC)
Electric vehicles	(Sovacool et al., 2019) (Norway)
Financial sector	(Hepburn et al., 2020; Zadek, 2019)
Renewable energy	(Müller et al., 2020) (Africa) (Goddard & Farrelly, 2018) (Australia)
Fossil fuels	(Le Billon & Kristoffersen, 2020; Pai et al., 2020)
Not industry-specific	(Green & Gambhir, 2020; International Labour Organization, 2016; Lamb et al., 2020; Muttitt & Kartha, 2020) (Carley & Konisky, 2020) (Global North) (Pianta & Lucchese, 2020) (EU) (Hirsch et al., 2017) (Global South) (Mertins-Kirkwood, 2017) (Canada)

To better understand the types of policy pathways linked to just transition discourse, in Table 3 we have clustered five policy trends that emerged from the literature. These clusters were distinguished based on five key characteristics: spatial scope, temporal scale, policy origin or authority flow, policy scope, and key nongovernmental actors involved in policy consultation. There may be variations within each of these policy trends, but the typology enables us to draw several conclusions about what seem to be the main tendencies and deficiencies of the current policy approaches to just transitions.

Table 3. Types of just transitions policy interventions and their characteristics

Type of policy intervention	Characterization					*Example* and references
	Spatial scope	*Temporal scale*	*Policy origin/authority flow*	*Policy scope*	*Key nongovernmental actors*	
Targeted industry goals/shifts	Local, regional, national	Short-term	Top-down	Industry/ site-specific	Employers; customers; employees	*Renewable energy incentives* (Kelly et al., 2020; Müller et al., 2020; Pai, Zerriffi, et al., 2020; Sovacool et al., 2020)
Employment /assistance for workers and industry replacement	Regional	Medium-term	Top-down; corporatist	Industry/ site-specific	Unions; employers; various economic stakeholders	*Transition assistance policies* (Green & Gambhir, 2020; Harrahill & Douglas, 2019; Oei et al., 2020; Weller, 2019)
Fossil fuel phaseout	Regional, national	Medium-term	Top-down	Industry	Environmental groups; unions	*Coal phaseout* (Brauers & Oei, 2020; Green & Gambhir, 2020; Harrahill & Douglas, 2019; He et al., 2020; Muttitt & Kartha, 2020; Oei et al., 2020; Sanz-Hernández, 2020; Snell, 2018; Weller, 2019)
Holistic/whole-system transformation	Local to national	Long-term	Bottom-up	Whole-system	Workers; environmentalists; Elders; cultural leaders	*ILO policies for just transitions* (Harrahill & Douglas, 2019; Pinker, 2020; Sovacool et al., 2020)
Green New Deal	National/ international	Long-term	Top-down	Whole-economy	Green parties; environmentalists	*European Green Deal* (Pianta & Lucchese, 2020; Zadek, 2019)

These policy pathways represent a broad summary of what has been done in the name of just transition. *Targeted industry shifts* focus on one industry and/or one specific economic location. While usually decided by a central government (and occasionally a regional one), this pathway includes short-term policies broadly directed at employers and employees, looking to shift capital and maintain employment and economic structures but move toward lower emissions or industries with greater sustainability. More focused *employment assistant programs* help workers (occasionally with the support of unions) find new work after the loss of an industry, and can be seen as a more targeted, corporatist approach compared to targeted industry shifts. *Fossil fuel phaseout* is an industry-wide approach, where a government mandates or accelerates the phasing out of a particular high-carbon energy industry in favor of a more sustainable one. The two more broad and least used pathways are the *Green New Deal* and *holistic/whole-system*. The former is

the wide, whole-economy-focused set of policies, across a national or international jurisdiction, reflecting the breadth of the problem of climate change; the latter is not necessarily well defined, but arises from community members experiencing transitions (bottom-up) and occasionally new board policy approaches that explicitly marry climate change issues and social development policies in ways that are context-specific and locally derived.

An overall conclusion stemming from Table 4 is that while jurisdictions have taken significantly variant approaches to policy for just transitions, there is no consensus on policy for a just transition, something policy critics frequently commented on in their analysis (e.g., Harrahill & Douglas, 2019; Pianta & Lucchese, 2020; Snell, 2018), nor is there a clear pathway forward that can demonstrate consistent success. What is apparent is that policy approaches to just transitions tend to be top-down, and derived at the national or (at most) regional level. Additionally, while just transitions are interdisciplinary or transdisciplinary by nature, few policy responses seem to take into account or acknowledge this. Instead, they are focused on specific locations or industries, and usually from an environmental and/or economic point of view alone. The only exceptions to this are the holistic (hypothetical) and Green New Deal pathways, both of which remain mostly discursive or hypothetical. Indeed, Pianta and Lucchese (2020) find the European Green Deal subject to elite capture and goal migration away from a just, holistic approach and toward favored industries and established socioeconomic relationships.

This flies in the face of evidence on the ground for those communities experiencing transitions, just or otherwise. While perhaps not a transition policy intervention, a whole-system or holistic approach is what those experiencing transitions are demanding. Ergo, policymakers should consider how they could integrate anti-racist, decolonial/reconciliation-informed, gendered, and environmental lenses in their policies. In those circumstances workers themselves lamented the absence of bottom-up, holistic, or cross-system approaches (Sovacool et al., 2020), which also need to take into account anti-racist, decolonial lenses (Lennon, 2020) if these policy solutions are not to replicate the structural inequities of today.

The International Labour Organization (ILO) seems to be moving in this direction, at least in part, through a pilot program to enable less developed countries to adopt and implement employment and social policies in support of national commitments on climate change, using the just transition policy framework and the related ILO guidance (Pinker, 2020). Ghana, the Philippines, and Uruguay have already begun this work in this cross-sector, cross-domain fashion (Pinker, 2020). While tying just transition work to development aid without decolonizing the latter could risk reinforcing structural inequalities, and the ILO practice still locates a fair amount of financial decision making outside of the jurisdiction in question, this explicit connection between social and climate change policies speaks to this shifting, emerging whole-system perspective.

Unfortunately, barring specific examples, policies in favor of just transitions are designed away from the location of economic and environmental crises and imposed onto those regions. This may be a function of each country's jurisdictional arrangements, but that reality does little to alleviate the sense of communal loss of identity and sense of self these communities experience (see Section 3.4 for further discussion). While transition may be necessary, and the climate crisis dire, these socio-cultural and economic factors are critical to consider for a successful just transition, and as of yet they are not prominent in policy action.

3.3 Islands and just transitions

In past years some islands have displayed particular commitment to transitioning away from fossil fuels. Examples come from Iceland (Kristjansdottir & Busch, 2019), Spain (*El Hierro, a Pioneer Island in the Energy Transition*, 2017), Australia (Boyer, 2019), Denmark (*Europe's Most Sustainable Islands Are Danish*, 2020; Wear, 2020), and Maine (Winner, 2017). There is a notable lack of islands in developing countries making similar progress in energy transitions, which aligns with our earlier point that the literature mainly focuses on the OECD countries.

Islands represent a unique and interesting context for energy transitions. Certain factors characteristic to islands may foster energy transitions, such as awareness about the finite nature of resources and the need for sustainable energy consumption (*El Hierro, a Pioneer Island in the Energy Transition*, 2017). Islands have the advantage of renewable energy generation being more competitively priced than fossil fuel–based energy, with the advantage growing the further geographically disconnected the island may be (Ochs et al., 2020). Islands may also more easily and quickly pursue a multi-level transition to renewable energy generation (Ochs et al., 2020). Such advantages may lead to an island-wide adoption of renewable energy generation and the widespread use of electric vehicles (Ochs et al., 2020).

On the other hand, as islands have limited resources and generally smaller populations, the conventional methods of energy transitions may cause certain difficulties (Kristjansdottir & Busch, 2019). For example, islands may have to pay higher prices for the same energy sources used by their mainland counterparts. Maine's islands, for instance, often pay more than 1 USD per gallon more for fuel to heat their homes (Winner, 2017), due to additional costs of transporting fuel to islands. However, this disadvantage could be overcome by sustainable energy generation (Ochs et al., 2020). In addition, there are increased costs for island residents to do much of the installation or certification work around sustainable energy. Initiatives have been developed in Maine, for example, to assist island residents with the prohibitive costs by completing bulk work, termed "collective purchasing". This initiative has been so effective that mainland Maine communities have followed suit (Winner, 2017).

Another possible challenge is related to island economies. Islands may be limited to specific economic activities, such as fishing or farming, depending on their size and location. Two islands in Denmark, Bornholm and Samsø, both faced crises when the fish population they relied on began to crash, and the local abattoir was closed, respectively (*Europe's Most Sustainable Islands Are Danish*, 2020; Wear, 2020). To address a changing economy, the Danish island of Bornholm turned to jobs in renewable energy systems. These two Danish islands have transitioned from fossil fuels to 100% renewable energy sources, winning them the Responsible Island Award presented by the European Commission (*Europe's Most Sustainable Islands Are Danish*, 2020). In Samsø, their renewable energy is provided through wind turbines across the island and local biomass. The energy produced by the turbines benefits all the inhabitants of the island, netting a negative carbon footprint (Wear, 2020). A critical factor in transitioning Samsø was the possibility for locals to buy shares in those wind turbines. This community purchasing power allowed many locals to earn money with the transition (Wear, 2020). The example of energy transition on Samsø shows that islands can successfully commit to renewable energy sources on the road to decarbonization while benefiting economically.

3.4 Just transitions at the community level

Although low-carbon initiatives are necessary to combat climate change, they may have negative economic and social implications for communities that rely on fossil fuel industries. The just transitions literature has acknowledged and documented such implications (Cha, 2020). The experiences of those connected to transitioning economies will largely be determined by what transition strategies are implemented, if any. Additionally, as stated by Svoboda et al. (2021), the acceptance of transitions by energy-producing communities will also be determined by and related to the transition planning and procedures that these communities will face.

Communities that consider fossil fuels as a prominent industry in their economy and rely on fossil fuels as their main source of energy are reluctant to accept economic transitions. For example, Wyoming's Powder River Basin (PRB) is the largest coal extraction area in the United States, and its community members have long opposed transitioning away from coal extraction. Those who challenge energy transitions in this region include coal industry workers, residents of the area, and local government bodies. Even after the unforeseen closure of two prominent mines in the PRB, members of this community maintained their opposing stances toward energy transitions and just transition policies (Cha, 2020).

Though these opposing sentiments arise from the unique history of each community experiencing an industrial shift, community members can often feel trepidation about the possibility of transitions due to a number of common factors. Next we discuss three main reasons for the reluctance toward energy transitions that are outlined in the consulted literature and that mainly focus on the coal sector, as the literature on community implications of energy transitions pays particular attention to the changes experienced by coal mining regions (see Table 4 for the summary and examples).

Table 4. Reasons for reluctance toward energy transitions

Reason	Example	Reference
Skill redundancy	Only 16% of coal miners in the Silesia region of Poland have a university education, and many coal miners lack transferable skills that would enable them to find work in other fields.	(Baran et al., 2020)
	Miners in the Silesia region may be hesitant to find work in new industries because their wages are likely to be ~50% lower than what they receive in the mining industry.	(Baran et al., 2020)
Loss of identity	In the coal-mining region of Appalachia, coal jobs are tied to family history and are considered an important part of the region's culture.	(Carley et al., 2018)
	In the US coal workers are well respected due to the difficult and dangerous working conditions that many have endured in current and past generations.	(Lewin, 2019)
Economic insecurity	Residents of Moffat County in Colorado, US, are highly dependent on the tax revenue generated from coal, and without it schools and governments would face a severe lack of funding.	(Mayer et al., 2020)

Reason	Example	Reference
	In the US some residents of coal-dependant communities believe that a transition away from coal would drastically increase their energy bills, as other forms of energy are perceived as expensive and unaffordable.	(Baran et al., 2020)

3.4.1 Skill redundancy

Fear of skill redundancy can act as a barrier to the acceptance of industrial transitions within and among energy communities. Energy workers often experience barriers to securing new employment due to factors such as lack of education and transferable skills, reluctance to obtain training in new fields, and reluctance to accept lower pay (Baran et al., 2020). Poland, for example, produces the highest volume of coal in Europe. As many European countries aim to lessen their carbon footprint, fossil fuel industries and their workers have felt the effects of this shift. Past government initiatives to phase out the coal industry in Poland have included transition plans that provided former coal workers with compensation over a two-year period to receive training for work in new industries (Baran et al., 2020). However, these plans have been largely unsuccessful, as many of the recipients received compensation yet did not find work in new industries. In the Silesia region of Poland individuals aged 15–44 who left the mining industry had only a 30% chance of finding work in different industries. This study also found that only 16% of miners held a university education, and many coal workers lacked the professionalism and "soft skills" required for work in other fields. Miners aged 40–49 are particularly susceptible to layoffs and redundancy, as they are "less willing to invest in acquiring new skills than younger workers in the 15–39 age group". As a result, older coal workers with low levels of education may have more trouble accepting transitions because they require them to gain training in a new field and essentially start their careers from square one (Baran et al., 2020). Additionally, mining workers in Poland are considerably well paid, and they may expect to be paid similarly when looking for work in different sectors (Baran et al., 2020). This can make former coal workers hesitant to accept positions in new industries.

3.4.2 Loss of identity

Extractive industries and their communities have demonstrated particular attachment to the culture associated with their respective lines of work. Della Bosca and Gillespie (2018) explored "generational coal mining communities" (GCMCs)—areas in which coal mining played a fundamental role in overall social, societal, and economic growth. In Australia the decline in coal has affected GCMCs not only from an economic perspective but also because of the loss of individual and communal identities (Della Bosca & Gillespie, 2018). This sentiment has been consistently noted in literature focusing on other regions facing industry transitions. In Poland coal workers also associate a large part of their culture and community identity with their line of work (Baran et al., 2020). In the coal mining region of Appalachia in the United States, many coal workers enter the industry simply because it is a trade that runs in their family over several generations (Carley et al., 2018). In many coal-producing regions, coal workers are viewed as hardworking people who bravely risk their health and their lives to support their families and contribute to the local economy (Lewin, 2019). According to some, the pride they felt working in a mine was comparable to having gone to war (Sanz-Hernández, 2020). Similarly, Baran et al. (2020) point out that mining jobs in Poland are generally well respected due to the historical

hardships undergone by coal communities, which enforces the strong sentiment of pride felt by many coal workers (Lewin, 2019). Although the negative health implications and dangerous working conditions that characterize the coal industry are well known, jobs in this field are still respected and viewed as important sources of employment, specifically for people without high school diplomas or post-secondary education, and men in general (Lewin, 2019). For many, the phaseout of coal is accompanied by loss of jobs, community culture, and personal and professional identity.

This theme of pride and identity in fossil fuel work can add a strong barrier to the acceptance of industrial transitions and just transitions policies, as fossil fuel workers will be unwilling to sacrifice a well-respected job and a shared culture.

3.4.3 Economic insecurity

With the decline of the dominant industry, communities start to experience economic insecurity. In the United States the increased use of renewable energy sources such as solar and wind have led to a decreased demand for coal. Coal-producing regions, often rural and isolated areas, are directly affected by the decline of the industry (Mayer et al., 2020). Often in small and remote locations, extractive communities may struggle to attract new talent and new industries (Cha, 2020). Residents of coal-producing regions tend to rely on coal for employment opportunities and tax revenue that the industry generates. Dependence upon a sole declining industry can obstruct the economic growth and social wellbeing of communities, as they may struggle to diversify their economies and create new jobs (Mayer et al., 2020).

A further concern shared by coal communities is that a transition away from coal would lead to drastic increases in monthly household energy bills, as it is widely believed that other forms of energy are highly expensive and unaffordable (Lewin, 2019). Concerns within this area allude to underlying energy poverty and a lack of equity for people struggling to supply their homes with the basic energy needed to get by. Mayer et al. (2020, p. 6) supports this point, stating that the decline in the coal industry will likely contribute to "energy insecurity worries." Although coal communities may experience physical health benefits from the closure of coal mines, there may also be some negative mental health implications due to the stress and insecurities that may arise from the decline of an industry that they depend on.

Localities that experience mining closures often experience a rise in unemployment, which can also result in population decline as former residents seek jobs in other regions (Krzysztofik et al., 2020). Spain has experienced difficulties with the implementation of just transition initiatives due to a steady decline in human capital in coalfield areas (Sanz-Hernández, 2020). In Spain the most prominent coal-producing regions have seen a population decline of 20–25% since 1990. Decarbonization of certain regions without the proper implementation of transition plans has left these areas in a "vulnerable" state and has also contributed to a loss of trust in all levels of government and their policies (Sanz-Hernández, 2020).

3.5 Just transition considerations beyond the fossil fuel sector

More recently, the energy transitions literature started to draw attention toward transition implications that may go beyond the fossil fuel sector and may pose justice concerns. For example, scholars stress that with current progress toward a low-carbon future, the demand for certain materials may significantly increase (Heffron, 2020; Lee et al., 2020). This increase has notable implications for the extraction sector, not only in Canada but also globally. Lee and colleagues (2020) argue that building a low-carbon future requires not only a transition away from fossil fuels but also improvements in technologies, supply chain management, and reporting practices in the material extraction sector. For example, future research on a just framework in the minerals extraction industry can help the transition toward a low-carbon society be just (Heffron, 2020). To tackle issues presented by the globalization of mineral extraction, Heffron (2020) recommends exploring multilevel governmental cross-border action and cooperation, ensuring that the extracted minerals are shared rather than hoarded by large conglomerates and manufacturers, and imposing appropriate taxes on the essential minerals.

With a focus on decarbonization, many countries are advocating for the widespread adoption of electric vehicles (EVs). If this push for EVs unfolds without policy changes, however, it may lead to increasing resource extraction pressures and creating unjust transitions around the globe. EVs are often referred to as zero-emission vehicles without considering their manufacturing emissions (Henderson, 2020; Sovacool et al., 2020). With the current technology used in manufacturing these vehicles and their components, the associated environmental impacts are offloaded to other regions around the globe (Henderson, 2020; Sovacool et al., 2020). Current battery technology requires the extraction and recycling of metals often available in developing countries such as the Democratic Republic of the Congo and Ghana (Sovacool et al., 2020). This divide is representative of many aspects of decarbonization in the developed world, and adds an environmental health gap to the already existing wealth gap (Sovacool et al., 2020).

In order to address these challenges, Henderson (2020) suggests that before the shift to EVs occurs, other sustainable alternatives should be explored. Such alternatives include restructuring cities and increasing population density to take advantage of improved public transport and bicycling infrastructure. These changes would alleviate the mineral extraction pressures we are headed toward (Heffron, 2020; Lee et al., 2020)by reducing private ownership of vehicles in large population centers, and reducing urban GHG production by up to 50% (Henderson, 2020).

These are just a few of the many possible areas of concern outside of fossil fuels when it comes to just transitions. Ensuring that the transition to decarbonization is just will require extending the parameters we currently use to define sustainable progress in a low-carbon transition (Sovacool et al., 2020). Transitioning to a more sustainable society should consider the life cycle of sustainability products, from resource extraction and manufacturing to recycling. Without these considerations, the transition will be accompanied by environmental and social injustices throughout the globe (Kramarz et al., 2021; Sovacool et al., 2020).

3.6 Just transitions and Indigenous perspectives

3.6.1. Colonial Transition to a Post-Colonial Reality?

Recent experience of the COVID-19 pandemic has made clearer the reality that one crisis can exacerbate and deepen structural problems within a wider system: economic shocks further divide political cultures (McNally, 2011), and floods and fires tend to expose those communities less well serviced in normal conditions to greater risk and slower recovery (Bernauer & Slowey, 2020). Moving analysis beyond the moment of crisis to the process of transition and sustainability highlights a frightening positive feedback loop: communities of color and those experiencing colonization bear the brunt of the economic, cultural, social, and environmental degradation of large-scale carbon-intensive energy projects, and are least likely to be included in the discussion of their remediation (Lennon, 2020; Sovacool, 2021; Zografos & Robbins, 2020). While the effects of climate change disregard cultural and political barriers, human social, governance, and economic structures and decisions determine who experiences the worst of these effects, and for how long, as this vulnerability is not incidental but "*the direct outgrowth* of social cleavages such as institutionalized racism" [emphasis in the original] (Lennon, 2020, p. 940). We are not, in fact, all in this together, and the path of transition we favor may push us further and further apart.

Few, if any, major historical extractive projects in Canada are not tainted by colonialism. Examples range from land use and extraction on Indigenous or at least disputed land, occasionally mitigated through the Duty to Consult or private Impact Benefit Agreements, and the socio-cultural impacts of large extraction sites on Indigenous communities—disproportionately affecting women—to the downstream effects of carbon-intensive industries on communities of color, primarily Indigenous ones. And yet in both the academic and grey literature, as well as in the real-world case breakdown, few meaningful references could be found to Indigenous engagement, let alone to the needs to decolonize while we transition, or to fully acknowledge the racialized realities of climate change and pollution.

The general (if not universal) failure to integrate treaties and reconciliation obligations into these discussions, despite the legal, economic, and moral obligations therein for Canada, Canadians, and Canadian economic practices, speaks to the power of the racialized lens, that it continues to silo and blind us to the whole system. Indeed, typical is Bernauer and Slowly's (2020) not incorrect discussion of potential benefits of large-scale extractive projects to Indigenous communities. Yet this does not take into account Indigenous perspectives on prosperity and how those perspectives may alter or inform the quest for sovereignty and a just transition across the boundaries between reserve and the wider community. This goes beyond the important critique of the focus on the Global North (Sovacool, 2021), and demands that we grapple with the vulnerabilities internal to each system, and the winners and losers each system has worked for years (centuries) to create and reinforce. And few studies could be found that employed an explicit decolonized or racialized perspective on the transition process, or its outcome, which seems to be a painful and powerful corroboration of Lennon's (2020) discussion of racial grief and post-colonial amnesia in the post-carbon movement.

This extends beyond a facile question of inclusion to the more fundamental question of resilience: for whom and of what? Technical solutions may be born in part of a "post-colonial amnesia," (Gandhi, 2018; Lennon, 2020), which is sadly evidenced in the lack of discussion or academic attention to colonialism as something from which we must transition for it to be just. Failure to grapple with colonial worldviews may make the transition process no less fraught than

the current reality. Sovacool (Sovacool, 2021) describes transitions as "power struggles and processes of exacerbating vulnerability," wherein a modern-day, enclosure-style political and economic low-carbon initiative (characterized here by enclosure, exclusion, encroachment, and entrenchment) further alienates those already vulnerable from the meaningful solutions to high-carbon economies.

Effective decolonization efforts are by their nature systems transformations (Andreotti et al., 2015). Acknowledging this gap while at the same time seeking ways to integrate Indigenous voices in this process, we sought out Elders and knowledge keepers whose perspectives were not yet privileged in academic or policy discussions.

3.6.2. Elders Consultation

It is important to acknowledge that our Elder discussions fell significantly short of both our original vision and what is required by this topic. To explain the former (the latter is a function of the breadth of the issue clashing with the design of this particular project, which will necessitate future work), the COVID-19 pandemic has hit Indigenous communities hard across Canada, especially Elders, making any kind of gathering difficult. Ergo, to satisfy university protocol, respect COVID precautions, and maintain as much tradition as possible, we needed to work with Elders we knew were technologically savvy and connected, to both share and discuss the research and accept online banking for honoraria. This meant the consultation was limited to two Blackfoot Elders (Siksika Nation) with whom one of the researchers had a preexisting relationship. In pre-conversation discussions it was agreed that tobacco would be exchanged in the future as a sign of good faith, and drafts of the high-level conclusions of the policy and case study reports, including herein, were shared.

After a prayer to start us in a good way, the Elders provided us with their feedback on the report, as well as their perspectives on just transition as a concept and as a general goal. This was a wide-ranging discussion, specific to a Blackfoot context, but also relevant to wider conversations about the place of justice in transitions. The discussion touched on history, economic sovereignty, worldviews, and epistemology. What follows is a high-level overview of that hour-long discussion, which was shared with the Elders for their consideration, feedback, and critique. Changes have been made where they suggested them.

First, what is done to the land cannot necessarily be undone. In the Alberta context, coal mining in the Rocky Mountains has fundamentally altered the landscape in an unrecoverable way. One Elder said, "Once you cut off the top of a mountain, it is no longer a mountain, which is drastically altering the majestic view of that mountain. Reclamation will not bring life back to the mountains since they have deep scars in them. Policies and land leases allow people to legally alter Mother Earth. It is not good." These are scars that no amount of policy can undo or heal.

The Elders cautioned against a limited economic lens, where all we see is dollar signs. This is in contrast with the old ways, where the land provided medicine, food, and tools, and where relationships between human and non-human inhabitants were privileged. Similar to a limited economic lens, a uniquely human focus limits our understanding of the world around us as well as the effects we may have on that world. We cannot separate ourselves from the natural world and its members, and how different might our actions be if we embedded that into our decision-making? Are these questions/lenses adequately integrated into just transition policy and approaches?

Second, many of the questions embedded in a just transition emerge from questions about economic justice and shared future prosperity. Yet these projects themselves represent an unjust transition for many Indigenous nations, whose ways of life were fundamentally altered with treaties. These treaties then made way for non-Indigenous settlement, including mining. The exclusion of Indigenous peoples from this previous boom was not preordained but the function of a racist system that interpreted treaties as final land sales, and used powers included in the Indian Act (which was never agreed to in treaties). One Elder reminded us that the treaties were not land giveaways but sharing agreements, and only then to the depth of a plough (two fists, one atop the other), meaning resources like coal or oil were never included. Another reminded us that water usage and sharing was omitted from Treaty 7, and yet many of these coal mines rely on—and permanently alter—those same waterways, which suggests their establishment is in violation of the spirit of those treaties.

Historically, Siksika itself had a coal mine, which provided good jobs and was established in consultation with Elders to minimize environmental damage. One Elder, whose father had worked in the mines, remembered that it was shut down by the government when local non-Indigenous communities complained. The Indian Act, which historically gave (and continues to give) significant authority to the federal government and their representatives—the Indian Agents—undermined any effort at economic self-sufficiency or tribal sovereignty, including this mine.

The Elders reminded us that the Indian Act's effects were sweeping, and these effects continue to undermine their community's capacity to engage in or determine a just transition. The loss of female leadership and the critical role they played in knowledge dissemination, the loss of intergenerational connection and exchange, and an erosion—if not a full loss—of a sense of community, in favor of a more individualistic or society, undermine Indigenous resilience and communities' capacity to respond to the needs of a society in transition.

The kind of colonial amnesia described in other settings is equally present here, as little thought seems to be given to addressing these socio-structural issues in Canada's just transition policy landscape. The legacy of colonialism is deep and will continue to shape us, Indigenous and not. We need to shift these conversations about just transition to be rooted in a desire for reconciliation between Indigenous and non-Indigenous peoples, between us and the natural world, to ensure prosperity is both better distributed in the future and built on stronger, more resilient foundations. The Elders reminded us of the importance of thinking forward in this way, integrating and supporting youth as future leaders.

Lastly, and most importantly, the Elders questioned the exclusive focus on a just *transition*. Instead, we returned to the idea of seeing ourselves as part of a wider world, and asked how that perspective could be rationalized with the interests of a just transition. *Transition*, they argued, was less important than a *just way of living* for all, and our responsibility is to be just stewards of our world, not owners. This is a transformative goal: what might policy at all levels, and across most domains, look like if the first questions we asked revolved around whether we are being just stewards of our world?

Additionally, project collaborator and respected Blackfoot knowledge keeper Paulette Fox (Kainai Nation) joined us for the conversation with the Elders. Paulette's work in the field of just stewardship is an exemplar of the work the Elders identified as critical. Paulette is also experienced in two-eyed seeing (Battiste, 2000), walking with one foot in an Indigenous world and one foot in a settler Canadian one. She introduced us to the Iinnii Initiative, which looks to work with Elders, communities, and our natural world cousins (animals, plants) as integrated

biocultures. The model Paulette shared was firmly grounded in a Blackfoot worldview, with a strong emphasis on language and story exchange.

The Iinnii Initiative, while in the early stages, may prove a template for a way of working with non-Blackfoot Indigenous communities interested in delineating their own just transition pathway or just stewardship reality.

4. Implications

The findings of this report show that the rapidly growing just transitions literature is full of energy and promise. The works produced in recent years have extended the thematic and geographic coverage of the topic, and have made more robust connections with the existing concepts and theories. Yet we believe that more work remains to be done to bring further conceptual clarity to the idea of just transitions, and to learn more about and develop effective practical approaches to advance the just transitions agenda. Next we summarize the key findings, detail the avenues for further research, and outline policy recommendations.

4.1 Just transitions and environmental justice literature

On the theoretical front, much attention has been paid to establishing conceptual connections between just transition and the ideas advanced in environmental, climate, and energy justice literature. However, this attention seems to be unevenly distributed. For example, in their recent scholarship (Williams & Doyon, 2019, 2020), who analyze how justice-related concepts are being addressed among the different bodies of literature, show that in just transitions scholarship, the recognition-related questions of justice are much less explored than those related to the distributive or procedural accounts of justice. This research gap directly links with our discussion about the need for a more comprehensive and in-depth incorporation of the postcolonial perspectives of just transitions. Newell (2021) also made such a call in his recent analysis of how and why race considerations should be better integrated into the energy transitions scholarship.

In addition, the present frameworks of just transitions mainly focus on the impact on humans and societies. Yet broader environmental justice literature is increasingly concerned with the impacts on non-human species by bringing to the forefront the concept of multispecies justice (Celermajer et al., 2020). This point aligns with Williams and Doyon's (2020) statement about the need to broaden the concept of justice that is applied to transition processes, and Sovacool's (2021) recent conclusion that among those who will be negatively impacted by climate mitigation efforts, non-human species are most frequently identified. Therefore, there is the need to integrate considerations about multispecies justice into the just transitions scholarship.

4.2 The geographical and sectoral coverage of just transitions literature

On the empirical front, our findings show that there seems to be uneven sectoral and geographical coverage of the just transitions literature. In terms of the geographical coverage, most of the studies focus on the OECD countries. This finding aligns with the conclusions recently drawn by Mertins-Kirkwood and Deshante (2019) and Pinker (2020). According to Pinker (2020, p. 18), "the concept of 'just transitions' has so far gained relatively little traction outside rich, highly developed countries in Western Europe, North America and Australasia." The reasons behind this trend are complex, and they should be taken into consideration while studying current practices and planning future actions (Pinker, 2020). In order to do so, it is important to extend the geographical coverage of this scholarship to better understand and

analyze the context-dependent nature of just transitions, and the local and regional nuances impacting just transitions processes.

In terms of sectoral coverage, cases covering the coal industry are particularly prevalent. This is understandable, as the coal industry has been at the forefront of the structural changes brought by the transitions to greener energy sources, and much attention has been drawn to the negative effects on the coal workforce. However, energy transitions will concern other fossil fuel sectors, such as the oil sector, as well as developments in renewable energy. The former are particularly important for Canada, as we have witnessed significant fluctuations in the oil markets over the past year, as well as the changed political climate affecting pipeline expansion. For example, Canada may see major changes, as the Biden administration has rescinded permits for the US portion of the Keystone XL Pipeline (Elash, 2020). In more recent developments, the Governor of Michigan, Gretchen Whitmer, has moved to shut down Enbridge's Line 5, citing the risk of a potential leak that would pollute the Great Lakes. Line 5 passes through the upper peninsula of Michigan and the upper peninsula of Wisconsin to the lower peninsula crossing the Straits of Mackinac, where it continues on to Sarnia, Ontario. The pipeline that supplies oil to Michigan, Wisconsin, southern Ontario, and Quebec (Zinchuk, 2021) has been in use for 68 years and is essential to transporting oil from Alberta and Saskatchewan. Closing the line may result in the loss of thousands of jobs across Canada (Bicknell, 2020; Zinchuk, 2021). All these developments make the just transitions agenda even more urgent for Canada.

As for the renewable energy sector, there has been growing evidence that diverse climate mitigation approaches, including the development of renewable energy facilities, may negatively impact local communities and the environment (Kramarz et al., 2021; Sovacool, 2021). Our findings also show that the sectoral expansion of the just transitions literature should go beyond the energy sector, as it will have implications for other sectors of the economy, such as mining. This point relates to the criticism voiced recently by Bennett et al. (2019, p. 3) that "the notion of 'just transitions' has focused almost exclusively on the energy sector. While renewable energy transitions are an essential component of sustainable futures, transformations across multiple sectors and human activities are required if humanity is to live sustainably." Such a holistic view is particularly noteworthy, as the current scholarship warns about the existence of a "decarbonization divide" between the countries of the Global North and the Global South, where decarbonization efforts further exacerbate environmental and social problems in the communities upstream and downstream from the supply chain (Sovacool et al., 2020).

4.3 Just transitions and the heterogeneity of agency

The findings of this report underscore the heterogeneous nature of agency that is and will be involved in energy transitions processes, and the need to explore different agentic efforts that can lead to just transitions. For example, Snell (2018) points out that the role of private sector organizations, as well as the potential of cross-sector partnerships, should be explored further. Mertins-Kirkwood and Deshpande (2019) found that the literature on just transitions does not fully encompass the contributions of think tanks, advocacy groups, or labor unions. The role of the latter is particularly noteworthy, as many of the studies that we reviewed highlight that just transition as an idea was created by labor unions, and that there is much overlap between the concerns expressed by labor unions and the problems environmental justice activists work on. Therefore, the alliances between labor movements and environmental movements should be further strengthened, and the labor concerns should be incorporated into environmental decision-making processes. As Ciplet and Harrison (2020, pp. 17–18) explain, it will be difficult to move

forward "without a solid vision of how a transition to a low-carbon economy can enhance labor rights and economic inclusion. Unfortunately, merely increasing 'green jobs' is not a sufficient strategy for ensuring sustainability or social justice goals." Labor unions should be actively involved in the discussions about just transition, and there need to be clear plans on how unionized jobs will be created in the post-carbon economy. This may address some of the opposition around phasing out fossil fuel industries and possible economic decline in the communities that rely on fossil fuels (please see Section 3.4 for a more detailed discussion).

An important stakeholder in just transition processes is local communities. Considering the impact of transitions on communities is fundamental to planning and implementing just transitions. Our review underscores that the communities who rely on fossil fuels as an essential part of their livelihoods and economic prosperity will face hurdles such as skill redundancy, loss of identity, and economic insecurity. Just transition plans can support fossil fuel communities by bridging the gaps between old industries and newer, more sustainable ones. In this process of transition, the voices of community members affected by industrial shifts should be included, and their grievances considered. Building collaborative working relationships with community members may facilitate the development of decarbonization initiatives, industry diversification plans, and just transition policies that are acceptable to and supported by those who formerly depended upon fossil fuel extraction for employment and tax revenues (Cha, 2020). Such a bottom-up approach contrasts with the top-down initiatives that are developed without any significant involvement of community members or affected workforce.

We identified five broad types of policy interventions for just transitions: targeted industry goals/shifts, employment/assistance for workers and industry replacement, fossil fuel phaseout, holistic/whole-system transformation, and Green New Deal policies. We conclude that policy approaches to just transitions tend to be top-down, and derived at the national or (at most) regional level, and that a whole-system or holistic approach is needed that will integrate bottom-up and cross-system approaches and take into account anti-racist, decolonial/reconciliation-informed, gendered, and environmental lenses. Thus, there is a need to better understand the relationships between "macro-scalar policy and community experiences with transitions" (Roemer & Haggerty, 2021, p. 1), and create planning processes that invite and empower diverse stakeholders and their perspectives.

4.4 Just transitions in Canada

The limited scope of the just transition initiatives that we noted earlier is also characteristic of the Canadian experience. In Canadian societal and political discourse, just transition has been primarily geared toward employment concerns. While the focus on labor issues in vulnerable industries is understandable and warranted, such a narrow understanding of just transitions threatens to disregard other issues. For example, Mertins-Kirkwood and Deshpande (2019) find that the just transition initiatives in coal mining communities in Canada are mainly focused on white males, disregarding the impact that transition may have on those not directly employed in the coal-mining sector, especially women, immigrants, and Indigenous individuals. Therefore, just transition initiatives should be developed with the view that decarbonization processes are tightly intertwined with other social issues, such as housing, gender equity, access to education, and labor standards and conditions, that go beyond the fossil-fuel industry (Hirsch et al., 2017; Patterson et al., 2018). In addition, policy coordination emerged as a significant obstacle to meaningful just transition work; this means that policies should be both bottom-up in design and effectively cross-jurisdictional in implementation. Our findings show that across Canada there is

discontinuity between individual provincial just transition agendas. Each province has developed its own plan tailored to what the current provincial government views as imperative for that province. These plans will continue to change as new governments are elected and power shifts occur in the provinces. Therefore, as just transitions are long-term processes, any plan must be insulated from shifts in government priorities as well as changes in government.

Given the scope and importance of the problem, a broader, national-level conversation is needed to develop key directions and priorities for just transitions. This work can be tied to ongoing policy initiatives, such as the Canadian Climate Accountability Act. In this conversation it is critical to incorporate Indigenous perspectives as full participants throughout any process and incorporate reconciliation goals with those of just transitions. While this may seem contradictory—both national and hyper-local in character—the reality of a just transition demands simultaneous cross-scale and cross-epistemological work.

Ergo, we propose the following recommendations:

- A permanent office/institutional arrangement at the federal level (i.e., deputy ministership), possibly in the Intergovernmental Affairs Secretariat, should be created and empowered to coordinate effective intergovernmental cooperation and fund initiatives that emerge locally.
- Meaningful support must be offered to communities to develop effective, data-informed just transition pathways for their unique contexts, to meet the needs/demands of federally coordinated work.
- Cultural, gendered, anti-racist, and decolonial/reconciliation lenses need to be integrated into any just transition pathway development, including at the funding, design, and implementation stages.
- Economic, social, and environmental externalities must be taken into account in policy discussions, including in the supply chain for any new technologies and/or energy sources.

5. Conclusions

This knowledge synthesis report reviews just transitions literature with the aim of contributing to the transdisciplinary and intersectoral envisioning and implementing of a just post-carbon society in Canada. We approached this research with a broader view in order to embrace the complexity and scale of the structural changes needed for just transitions. The results are both promising and cause for pause; while there is significant and growing interest, the challenges of just transitions are complex and profound.

The findings of this report reveal that the concept and practice of just transitions have enjoyed remarkable attention in the past few years, especially during 2020. This rapid and substantive progress gives hope that more will be accomplished to further advance the concept of just transitions and develop effective and context-sensitive practical approaches. Our main conclusion is that there is a need to expand the scope of the scholarship and policy in order to more comprehensively grasp the scale and complexity of just transition processes. As Sovacool et al. (2020, p. 17) note, "the patterns of injustice and domination are embedded in existing processes of decarbonisation, in spite of the assumption that low carbon trajectories represent a more just way of producing energy." Therefore, more work needs to be done—by scholars, policymakers, and practitioners—to make sure that energy transitions do not result in the decarbonized alternatives of unequal and unjust energy systems.

Our findings revealed that the process of developing and implementing just transition solutions is a challenging and nonlinear one, where "surprises and unintended consequences are one of the few things that are certain" (Newell & Simms, 2020, p. 7). The report has also pointed out that transitions are value-laden processes, as there may be divergent views on what constitutes "right" and "wrong" ways to pursue energy transitions. As there are multiple opinions on how just transitions should unfold, and as the process involves many different actors (especially in the multi-jurisdictional context of Canada) with various interests and aspirations, tensions and even conflict may be unavoidable (Ciplet & Harrison, 2020). Such tensions may be particularly acute when attempting to accelerate energy transitions—bold decisions to move forward with the transition agenda may be in conflict with justice considerations (Ciplet & Harrison, 2020; Newell & Simms, 2020). It is therefore important to remain open to challenges, tensions, and frictions that may emerge while developing and implementing just transition solutions, and to acknowledge that success will depend on the willingness and efforts of actors to listen, share, and understand.

6. Knowledge mobilization activities

We intend to reach out to both non-academic and academic audiences to disseminate the findings of this report and hopefully build on this work to expand our inquiry. Because of the ongoing Covid-19 pandemic, there is some uncertainty about when and how the planned activities will take place; however, in the coming year we intend to follow the plan outlined below.

Outreach to non-academic audiences

The primary research users of the knowledge synthesis report are expected to be government officials and non-government and private organizations that work on the issues of just transitions, as well as Indigenous communities. The synthesized report about the state of the knowledge and practice will provide government officials with a range of policy possibilities on how to facilitate equitable transition in the fossil fuel sector and beyond, and provide practitioners with an understanding of the latest trends and initiatives globally. In order to reach all these audiences, the results will be disseminated through both traditional and non-traditional channels. What follows is a description of the specific knowledge dissemination activities, planned based on the target audience.

Public, not-for-profit, and private organizations: We will produce and disseminate a two-page evidence brief of the wider knowledge synthesis report to share with interested stakeholders, including government officials and representatives of not-for-profit and private organizations. Since interested parties are based all around the world, both the evidence brief of the report and the full-length report will be available online.

The co-applicant Dr. Nino Antadze will organize a meeting in Charlottetown, PEI, to discuss the findings of the research with the representatives of the provincial government. Representatives of the Department of Environment, Energy and Climate Action and the Department of Transportation and Infrastructure will be invited. The project collaborator, Dr. Laurie Brinklow, will assist in organizing this event given the long-standing collaborative relationship between the Institute of Island Studies and the PEI government. Both the two-page evidence brief of the research and the full-length report will be sent to government officials prior to the meeting.

In Calgary the Energy Futures Lab (EFL) has agreed to support a <u>workshop</u> to launch the final project, which will be open to the Mount Royal and Calgary communities. This event will be organized by co-applicant Dr. Katharine McGowan in collaboration with the Energy Futures Lab, a collaborative innovation platform based in Alberta. Both the two-page evidence brief of the research and the full-length report will be sent to participants prior to the workshop.

Outreach to academic audiences
The synthesis of the knowledge presented in the report will be of interest to academics from various disciplines who work on environmental policy and governance, environmental justice, environmental planning, socioeconomic transition, and other thematic foci. The deliverables of this research will also be used in teaching practices by the principal investigators and collaborators.

We plan to produce two <u>peer-reviewed academic articles</u> that summarize our processes, conclusions, and critical questions raised to move the inquiry further. Possible publication outlets include *Journal of Innovation*, *Environmental Innovations and Societal Transitions*, *Business & Society*, *Research Policy*, *Energy Research*, and *Social Science*. To ensure the wide reach of the study results, peer-reviewed publications will be published in open-access forms.

We plan to present the results of the research at <u>academic conferences</u>.

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