



# Disability Inclusion in the Green Economy: A Scoping Review of Challenges, Barriers and Opportunities



Alexis Buettgen<sup>1\*</sup>, Katherine Lofts<sup>2</sup>, Emile Tompa<sup>3,4</sup>

<sup>1</sup> Department of Psychology, Wilfrid Laurier University, N2L3C5 Waterloo, Canada

<sup>2</sup> Faculty of Law, McGill University, H3A0G4 Montreal, Canada

<sup>3</sup> Institute for Work and Health, M5G1S5 Toronto, Canada

<sup>4</sup> Department of Economics, McMaster University, L8S4L8 Hamilton, Canada

\* Correspondence: Alexis Buettgen ([abuettgen@wlu.ca](mailto:abuettgen@wlu.ca))

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**Abstract:** Individuals with disabilities have long faced disproportionate economic disadvantages, including higher poverty rates, poorer health outcomes, limited access to education, and restricted employment opportunities compared to those without disabilities. The green economy, characterized by low carbon emissions, resource efficiency, and social inclusivity, holds the potential to address these persistent inequities by creating jobs that promote income equality and support sustainable livelihoods. However, despite the growing global shift toward carbon neutrality, there is a significant gap in understanding the challenges and opportunities faced by persons with disabilities in this transition. This scoping review aims to assess the current state of knowledge regarding the inclusion of persons with disabilities in the green economy, with a particular focus on the Global North. Literature published between 2012 and 2023 was systematically reviewed, resulting in the identification of 21 relevant studies from an initial pool of 4,311 abstracts. The findings were categorised into three primary themes: conceptual frameworks for inclusion in the green economy, the role of persons with disabilities as workers, and the role of persons with disabilities as consumers. The results underscore a critical lack of literature addressing disability inclusion in green economic development, with existing studies indicating that persons with disabilities have been systemically marginalized in efforts to foster low-carbon economies. This exclusion represents a missed opportunity to harness the talents, perspectives, and contributions of persons with disabilities, whether as workers, consumers, or agents of change in sustainable development. It is therefore imperative that the experiences and epistemologies of persons with disabilities are central to the design, planning, and implementation of green economy initiatives. Future research must address the existing gaps in the literature and explore strategies for fostering greater inclusion in green economic frameworks to ensure equitable opportunities for all individuals in the transition to a carbon-neutral world.

**Keywords:** Disability; Social and economic inclusion; Employment; Social equity; Community engagement; Green economy

## 1 Introduction

Climate change and equity issues are inextricably linked. These linkages are articulated in a growing body of literature about the disproportionate impacts of climate change on people experiencing poverty and other forms of oppression and marginalization [1–4]. This literature indicates that equity issues must be central to ensure social justice in climate action and the inclusive development of green economies. At a global level, it is now recognized that wealthy countries of the Global North should provide significant financial and technical support to individuals and communities most vulnerable to the impacts of climate change given these countries' extensive contributions to these intertwined problems [5, 6].

However, disability issues have received limited attention from scholars, practitioners, and policymakers in the context of climate change [7]. As a result, persons with disabilities are increasingly highlighting the disproportionate impacts they face from climate change and advocating for their inclusion in climate adaptation and mitigation strategies [8, 9]. For instance, individuals with disabilities experience mortality rates two to four times higher than

the general population during climate emergencies such as heatwaves, floods, and wildfires. They are also disproportionately vulnerable to slow-onset climate change, despite contributing minimally to global warming [10]. During climate crises, persons with disabilities encounter unique barriers, including inaccessible emergency preparedness plans, transportation, and shelter options [11]. In the aftermath of such events, they face significant challenges in rebuilding their lives, particularly in terms of accessing suitable housing, food and water supplies, employment, and economic support [12]. Additionally, persons with disabilities face heightened risks of vector- and water-borne diseases, as well as mental health issues, such as post-traumatic stress disorder. These health problems can exacerbate pre-existing conditions, leading to increased morbidity and mortality. Moreover, slow-onset phenomena such as rising temperatures, fluctuating rainfall patterns, and water salinization will impact various economic sectors (e.g., agriculture) and access to safe working conditions [13]. While climate change affects all populations, persons with disabilities face greater challenges in adapting due to the compounded effect of social determinants of health and barriers to accessing economic, social, and healthcare resources.

The impacts of climate change compound the existing socioeconomic challenges that persons with disabilities experience, including high rates of poverty, limited employment opportunities, poorer health, and lower levels of education than persons without disabilities. The profound poverty of persons with disabilities has been found to be both a cause and consequence of their exclusion from social, economic, legal, and political life [14, 15]. As such, disability issues are included in several targets under the Sustainable Development Goals (SDGs), including goals one, eight, and ten, which aim to end poverty, develop decent work and economic growth, and reduce inequalities, respectively. The goals recognize that ending poverty and other deprivations must go together with strategies that enhance the capacities of structurally vulnerable groups (including persons with disabilities), improve health and education, reduce inequality, and spur economic growth—all while tackling climate change [16].

Despite this recognition, data on climate and environmental change impacts on disabled populations is deficient [12]. More must be done in research and public programming to meaningfully advance the inclusion of persons with disabilities in ways that extend and deepen the continuum of opportunities for sustainable development and economic participation. A green economy presents a unique opportunity as it is defined by the UN Environment Programme [17] to be low carbon, resource efficient, and socially inclusive. Its key features include the creation of jobs that pay a living wage and promote equality of opportunity and income. However, there is a growing recognition that the transition to a green economy has the potential to both dismantle and reinforce social inequities for persons with disabilities [7, 18, 19].

Little is known about the barriers and opportunities that persons with disabilities are facing in the shift towards more sustainable forms of economic development. As industrialized countries of the Global North move forward with plans to transform their economies to achieve carbon neutrality by 2050 [19], it is critical that we know more about the potential contributions of persons with disabilities to green economies and the types of practices that can yield transformative changes through poverty reduction, social inclusion, and employment. Persons with disabilities comprise at least 16% of the world's population and are the largest minority group [20]. Thus, without an explicit focus on creating opportunities for persons with disabilities, the lofty goals of a socially inclusive green economy will remain unreachable.

This article aims to fill a gap in knowledge about the challenges, barriers and opportunities for equity and inclusion of persons with disabilities in the design, development and implementation of a green economy. This is the first review of the scholarly literature about disability inclusion in a green economy with a focus on the Global North. Specifically, the objectives of this review were:

1. To complete a scoping review of the scholarly literature to determine the state of knowledge and evidence about the challenges, barriers, and opportunities for disability inclusion in the green economy;
2. To characterize the terms, phrases, and frameworks used to define disability and the green economy;
3. To summarize the themes, trends, and evidence in the literature; and
4. To identify existing gaps and propose future research directions to fill them.

To set the context for this review, we begin with some background literature to present our conceptual framework before describing our methods, presenting our results, and discussing the findings and implications of this research.

## 1.1 Literature Review: Conceptual Framework and Context

This review has been developed within a critical disability and environmental justice conceptual framework. We define disability in accordance with the United Nations Convention on the Rights of Persons with Disabilities (CRPD) as, “long-term physical, mental, intellectual, or sensory impairments that, in interaction with various barriers, may hinder [an individual’s] full and effective participation in society on an equal basis with others” [14]. This definition conceives persons with disabilities as diverse, rights-bearing citizens and embraces substantive and transformative conceptions of equality that address the physical, economic, institutional, and social barriers that undermine their rights and dignity [21]. It includes people with mental health issues and people with chronic illness. It also considers the multiple intersecting identities that persons with disabilities hold, as well as forms of oppression related to their

sex, gender, age, race, ethnicity, or other characteristics.

This definition aligns with critical disability theory, which contends that achieving equality, well-being, and empowerment for persons with disabilities is not an issue of medicine, health, rehabilitation, or charity; rather, it is a question of politics, power, and powerlessness [22, 23]. Critical disability theorists, researchers, and activists have raised key questions about the individualization and medicalization of disability within the context of capitalism and colonialism, producing a growing body of evidence to help explain the disproportionately low employment rates and high levels of socioeconomic poverty experienced by persons with disabilities. This critical perspective has led to a broad conceptualization of the goals and purpose of the disability movement, which is to seek radical transformation in the way society perceives and acts toward persons with disabilities, placing greater value on interdependence over independence and collectivism over individualism [22].

Similarly, environmental justice highlights the ethical and moral dimensions of climate change as both a social and political issue. It has become a central focus for environmental organizations advocating for climate debt and historical responsibility, demanding justice for the communities most vulnerable to the climate crisis [24, 25]. These communities are frequently excluded from decision-making processes related to climate action, whether in terms of mitigation or adaptation [26]. Key aspects of environmental justice include distributive, recognition, and procedural justice, as well as the relationships between them. Distributive justice concerns how the impacts, costs, and benefits of climate change are shared among different stakeholders. Recognition pertains to whose voices and knowledge are heard and respected in decision-making processes. Procedural justice refers to how decisions are made and who is involved in the process [27]. These dimensions are interrelated, with recognition being vital for meaningful participation and equity in climate policy. Furthermore, the knowledge that informs decisions is shaped by power dynamics and access. The environmental justice framework challenges the dominant social paradigm, rooted in traditional economic models, which often prioritizes short-term political interests and neglects long-term considerations, thereby passing on the burden of addressing climate change to future generations.

Previous literature indicates that persons with disabilities have been peripheral in environmental justice discourses [28]. It suggests that the broad aims of both the environmental justice and disability movements, though developed in separation, coalesce around ideas of social transformation, reflected in the call for a paradigm shift that is required for typically marginalized and excluded groups and movements to become centered in ‘mainstream’ frameworks to responses and climate change [29]. In particular, disability issues appear to have been largely ignored in scholarly discourses on the green economy. The present study aims to critically examine this apparent gap to explore and synthesize scholarly literature and advance knowledge about the challenges, barriers, and opportunities for disability inclusion in a green economy.

## **2 Methods**

A scoping study method [30] was selected to gain a comprehensive overview of the literature on the topic of disability inclusion in the green economy. A five-stage methodology was adopted to produce a comprehensive review of the literature.

### **2.1 Identifying the Research Questions**

Given the limited evidence and knowledge surrounding disability inclusion in the green economy, the broad research questions addressed were: 1) What is the current state of the scholarly literature on disability inclusion in the green economy? 2) What terms, phrases, and frameworks are used to define disability and the green economy in the found literature? 3) What is known from the existing literature about the challenges, barriers and opportunities for inclusion of persons with disabilities in the green economy?

### **2.2 Identifying Relevant Studies**

In line with an environmental justice framework, the present study focuses on countries of the Global North because they have a disproportionate responsibility for climate change in comparison to the Global South and should take actions to address it. Research indicates that most industrialised high-income countries are responsible for 90% of excess carbon emissions [5]. For purposes of relative comparability, we limited our review to studies that focused on countries in the Global North with similar political economic contexts, including Canada, the USA, Western Europe, Australia, and New Zealand. In identifying relevant studies, the terms “disability” and “green economy” were given relatively broad definitions. As noted above, we used the CRPD definition of disability and the UN Environment Programme definition of green economy. We included relevant issues of environmental and climate justice, climate change, just transition, green jobs, green employment, green incentives, sustainability, and the circular economy.

A general search was carried out using multiple search terms and a short reading list that contained recent and relevant studies on the subject. Search terms were then generated using keywords that were identified from an initial reading list. The electronic databases used for the searches were PsycINFO, Scopus, ABI Inform, and JSTOR. We

worked with qualified librarians to identify relevant keywords and databases. We then devised an initial search strategy, which was later refined in light of early results. The search terms were grouped (see Table 1), and the results required at least one search term related to disability and the green economy. As we became more familiar with the literature, we redefined search terms and undertook more sensitive searches of the literature. We did not place strict limitations on search terms, identification of relevant studies, or study selection at the outset. This process was iterative, requiring us to engage reflexively with each stage and, where necessary, repeat steps to ensure that the literature was covered in a comprehensive way.

### 2.3 Selecting Studies

The initial search identified 5,081 studies. Abstracts of studies returned by the search engine were first read by the reviewers, and those that were deemed relevant (n=150) were selected for full text review. The first and second authors (AB and KL) conducted the primary screening of the findings. The “Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)” flow diagram (Figure 1) outlines how papers were selected for the review.

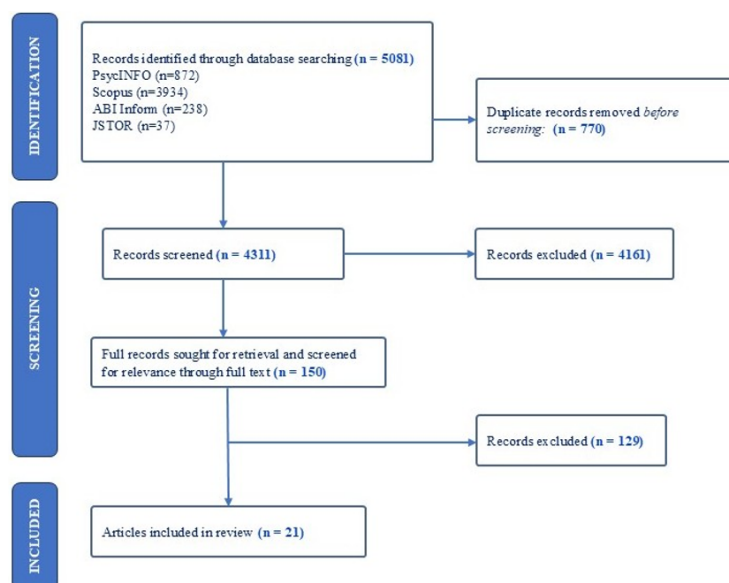
Inclusion criteria were broad. Once the initial search was performed, 770 duplicates were removed. Covidence software was used to assist with the screening process and to remove duplicates. Studies were then selected by pre-determined inclusion criteria and de-selected by the following exclusion criteria:

- Not in English
- Published before 2012
- Did not examine the green economy
- Did not examine disability
- Did not examine countries in the Global North
- Book reviews
- Learning guides

Thus, we excluded studies from countries in the Global South and eastern Europe, including China and Russia. We also excluded grey literature not published by commercial publishers and outside the mainstream of published literature.

**Table 1.** Search terms used

((“disabilities” OR “disability” OR “disabled” OR “mental health” OR “mental illness”) AND (“green economy” OR “green employment” OR “green job” OR “green jobs” OR “climate change” OR “climate action” OR “climate justice” OR “environmental justice” OR “just transition” OR “green incentives” OR “sustainability” OR “circular economy”))



**Figure 1.** PRISMA flow diagram of included texts

## 2.4 Charting the Data

Once all exclusion criteria were applied, the data from the remaining studies (n=21) were charted under the following headings: Author, Year, Article title, Journal or book title, Location, Study design, Relevant results (See Table 2).

**Table 2.** Charted data of included texts

Author, Year	Title	Publication	Study Location	Design	Key Findings: Opportunities	Key Findings: Challenges and Barriers
Angelini et al. [31]	An Innovative Perspective on Disability at ATF GAIA and ESAT Les Palmiers	Global Business and Organizational Excellence (GBOE)	France	Case study	Businesses with sustainable development and social justice missions that employ a substantial number of persons with disabilities can yield social, economic and environmental benefits; Government wage subsidies support employment opportunities.	“Legal and technical difficulties” required special project management; Need to reduce dependency on wage subsidies and economic balances to advance “the emergence of a new image of true diversity” in green enterprises.
Barbet et al. [32]	Design of an assessment tool for implementing assistive technology (AT) reuse programs in France	Resources, Conservation and Recycling Advances	France	Process evaluation & literature review	AT reuse programs make more devices available and less expensive while reducing landfill waste; Some AT reuse programs employed persons with disabilities; Public subsidies supported initial project investments.	Regulatory context did not favor this type of activity since the principle of reimbursement of new ATs, enforced in France, did not apply to second-hand ATs.
Bruyère and Filiberto [18]	The green economy and job creation: Inclusion of people with disabilities in the USA	International Journal of Green Economics	USA	Commentary	The green economy presents public, private, and non-profit sector opportunities to advance equitable employment.	Green jobs are often entry-level and do not currently reflect higher rates of inclusive employment; challenges to career advancement for workers without further training are linked to occupational demand.
Ceballos et al. [33]	Overlapping vulnerabilities in workers of the electronics recycling industry formal sector: A commentary	American Journal of Industrial Medicine	High-income countries	Commentary	The growing e-recycling industry provides employment opportunities.	Worker exposure to hazards is increased by a high proportion of small businesses in the e-recycling industry, precarious employment, limited health and safety controls, and low rates of health insurance across the industry.
Alonso-Martínez et al. [34]	Disability as a Driving Force of Sustainable Business Models in the Fourth Sector	Entrepreneurship in the –Fourth Sector: Entrepreneurial Ecosystems and Sustainable Business Models	Spain	Case study	Opportunities to create business models through the integration of social and environmental issues; Engagement of all employees (including workers with disabilities) in these issues is a business benefit; Government wage subsidies support employment opportunities.	Fourth sector organizations that have active sustainable business models but which continue to operate as “traditional firms” should address discrimination and potential exploitation of workers with disabilities in accordance with their organization’s distinguishing characteristics.

Author, Year	Title	Publication	Study Location	Design	Key Findings: Opportunities	Key Findings: Challenges and Barriers
Fenney and Salkeld [35]	Sustainable lifestyles for all? Disability equality, sustainability and the limitations of current UK policy	Disability & Society	UK	Policy analysis	Recommends Agyeman & Evans' Just Sustainability framework for disability inclusion in sustainability policy because the framework incorporates social, environmental and economic factors in terms of inequalities.	"Sustainability visions and policies share an individualistic understanding of humanity and prize a traditional view of independence –and thus both may have embedded neoliberal assumptions."
Hamraie [36]	Alterlivability speculative design fiction and the urban good life in starhawk's fifth sacred thing and city of refuge	Environmental Humanities	North America	Conceptual	Alterlivability in urban planning can provide recognition of life as livable beyond economic calculations in a just transition to a green economy; Core permaculture principles offer a framework for the centrality of persons with disabilities in all environmental designs beyond capitalism.	Neoliberal sustainability politics – particularly its tendency to emphasize individual accountability, harness market forces, and lead to "green gentrification" – excludes and marginalizes persons with disabilities in the economy, as well as in society and built environments.
Jodoin et al. [7]	A disability rights approach to climate governance	Ecology Law Quarterly	International	Legal and policy analysis	Human rights mechanisms and UN treaties (e.g., CRPD) provide a framework for inclusive climate governance.	Inaccuracy and lack of data and knowledge on disability and climate undermine inclusive climate action planning, policies and response efforts.
Johnson and Alaimo [37]	Bringing Together Feminist Disability Studies and Environmental Justice	Disability Studies and the Environmental Humanities: Toward an Eco-Crip Theory	USA	Conceptual	Environmental Protection Agency (EPA) in USA is strategically seeking job candidates with lived experience of disability.	Education requirements excluded job seekers with disabilities. Lack of demonstrable accountability with respect to environmental and disability justice from the EPA and other employers.
King and Gregg [38]	Disability and climate change: A critical realist model of climate justice	Sociology Compass	USA	Critical realist review	Persons with disabilities can strengthen their livelihoods by diversifying green jobs should be accessible to all, as should policies that promote disability inclusion in just market transitions.	Ongoing exclusion of persons with disabilities from discussions of climate change measures heightens their vulnerability and excludes valuable insight into the complex issue of climate change.
Larrington-Spencer et al. [39]	Disabled Environmentalisms	Diversity and Inclusion in Environmentalism	UK	Conceptual (literature review)	Disabled experiences and epistemologies should be centralized in efforts to counter neoliberalism and climate change.	The conflation of disability with injustice, toxic environments, and environmental degradation limits the agency of persons with disabilities and devalues disabled experiences



Author, Year	Title	Publication	Study Location	Design	Key Findings: Opportunities	Key Findings: Challenges and Barriers
Middlemiss [40]	Who is vulnerable to energy poverty in the Global North, and what is their experience?	WIREs Energy and Environment	Global north	Realist synthesis	Including persons with disabilities in issues of energy poverty provides recognition and access to benefits; Persons with disabilities should be brought into just transitions agenda.	“A transition to net zero is highly risky for energy-poor households, who enter into the transition at a disadvantage [including persons with disabilities]. Understanding this starting point is critical in ensuring the energy poor are able to participate in the transition to net zero and are not subject to further disadvantage through it.”
Morris and Pi-ovesan [41]	Integrated crayons for adaptive needs	C3 - Proceedings - Frontiers in Education Conference, FIE	USA	Case study	Engaging lived experiences of children with disabilities to promote innovative recycling of crayons.	Student, teacher and service provider engagement in the co-design of new products requires intrinsic motivation and access to material resources and technology to replicate this process for other products.
Oldfrey et al. [42]	Could assistive technology provision models help pave the way for more environmentally sustainable models of product design, manufacture and service in a post-covid world?	Sustainability	International	Mixed methods	Building local capacities for assistive technology reuse strategies engages persons with disabilities as consumers in the circular economy and offers employment opportunities “with digitally led [e.g., 3D printing] processes bringing more access to user-led making.”	Additive manufacturing is currently dominated by plastic; other materials have higher price tags. “Many groups are working on circularizing additive manufacturing by recycling printing material. . . however, there are hurdles to overcome if scale is to be achieved for these approaches.”
Osborne [43]	Collective care and climate repair	Dialogues in Human Geography	Australia	Commentary	Knowledge and experiences of persons with disabilities living in a socially and economically “hostile” world are valuable to effective climate adaptation and mitigation.	Capitalist realism promotes hegemonic thinking; purity politics can stymie action and impede solidarity in anti-capitalist action.
Sanz et al. [44]	The role of accessibility in energy and waste saving	World Congress on Sustainable Technologies (WCST-2012)	Spain	Qualitative document review	Building disability accessibility into energy and waste-saving policies and practices increases the customer base in the sustainable tourism industry.	There is a lack of accessibility variables in current public and private infrastructures and services in the tourism industry.
P.J. Stein and M.A. Stein [45]	Disability, Human Rights, and Climate Justice	Human Rights Quarterly	International	Legal and policy analysis	CRPD, SDGs, and the Paris Agreement promote participation of persons with disabilities in the creation of climate adaptation and mitigation measures, including employment and economic reforms.	Disability is inadequately treated in climate adaptation and mitigation measures; There is a dearth of disability disaggregated data, participatory research, or academic inquiry on the effect of a wider scope of climate resilience approaches.

Author, Year	Title	Publication	Study Location	Design	Key Findings: Opportunities	Key Findings: Challenges and Barriers
Upham et al. [46]	Energy and transport poverty amidst plenty: Exploring just transition, lived experiences, and policy implications in Iceland	Renewable and Sustainable Energy Reviews	Iceland	Case study	Inclusion of persons with disabilities in energy and transport poverty research, infrastructure, and just transition measures advances green economic policy development for a broader public reach.	Energy and mobility transitions are not socially inclusive; Neoliberal ethics contribute to this exclusion.
Van-Wynsberghe [47]	Green jobs for the disadvantaged in British Columbia: the perspectives of non-governmental organisations and social entrepreneurs	Local Environment	Canada	Grounded theory; mixed methods	Green jobs are necessary to address equity considerations since low-income groups (including persons with disabilities) are likely to be adversely impacted by the transition to the zero-carbon economy. These should be supported by government incentives.	Green businesses were unsure about the role of “social hiring” in their overall business model and were challenged by a lack of funding and staffing to sustain and grow, which was compounded by limited provincial government support.
Vogelauer et al. [48]	The role of disability and accessibility in corporate sustainability reporting	International Journal of Disability Management Europe	Document review; Interpretive content analysis	Increasing attention to disability and accessibility issues in environmental and economic sustainability efforts can in turn contribute to social sustainability.	Disability and accessibility in corporate sustainability reporting have largely been neglected and relegated to social sustainability considerations, which are given less attention than environmental and economic sustainability.	
Wood and Roelich [49]	Tensions, capabilities, and justice in climate change mitigation of fossil fuels	Energy Research and Social Science	UK	Theoretical synthesis	Nussbaum’s capabilities approach presents opportunities to recognize and integrate considerations of well-being into climate change mitigation efforts.	A negative relationship between climate change mitigation and well-being arises through demand-side mitigation, which requires broad changes to consumption habits and lifestyles and disproportionately impacts low-income and “vulnerable groups”.

## 2.5 Collating, Summarizing and Reporting Results

Data gathered from the charting exercise were used to develop themes and details of the existing knowledge under each theme, as well as to create summary statements about the evidence base under each theme in order to address the objectives of the review.

As per Arksey and O’Malley, a thematic analysis approach was used to analyze the content of the included articles. The data from each selected study was collated, presented and reported in the results section of the review.

The significance of the data was examined under three major themes:

- Conceptual frameworks for understanding disability inclusion;
- Persons with disabilities as workers in the green economy;
- Persons with disabilities as consumers in the green economy.



### 3 Results

Twenty-one articles met the inclusion criteria and were retained for the review. Table 2 above provides a charting of the data of the articles. Included articles were retrieved from journals and edited collections in the fields of environmental studies (n=7), interdisciplinary studies (n=3), disability studies (n=2), law (n=2), business (n=2), occupational health and safety (n=1), economics (n=1), sociology (n=1), education (n=1), and geography (n=1). Geographically, one article focused on Canada, three on the USA, nine on Western European countries, and the rest were international in scope with explicit considerations for the “Global North”. Fourteen research articles were included using seven research designs: case study, process evaluation, literature review, document review, legal and policy analysis, grounded theory, and mixed methods. Four conceptual articles and three commentaries were also included in the review.

The literature was categorized into three themes focusing on 1) conceptual frameworks for understanding disability inclusion in a green economy, 2) persons with disabilities as workers, and 3) persons with disabilities as consumers in a green economy. Next, we will summarize these articles according to these three themes (although some articles fell into one or more categories of analysis).

#### 3.1 Conceptual Frameworks for Understanding Disability Inclusion in a Green Economy

Eight articles discussed conceptual frameworks for understanding disability inclusion in a green economy. These articles critically analyzed the opportunities and challenges for anti-capitalist approaches, sustainability discourses, just transition, and human rights frameworks.

Four articles used an anti-capitalist and critical disability lens to conceptualize disability inclusion in a green economy within broader discussions of climate justice, environmentalism, and sustainability [35, 36, 39, 43]. These articles argued that climate change and environmental degradation are the result of capitalist systems of growth, consumption and production relying mainly on fossil fuels or other sources of greenhouse gas emissions, as well as neoliberal values of individualism, privatization, and deregulation of markets. In this context, disabled experiences and epistemologies were described as the object against which capitalist futures are imagined, because they often do not fit within capitalist modes of production or the labour market, and they value interdependence over independence and individualism [39]. Such capitalist futures are the antithesis of environmentally sustainable futures; therefore, disabled experiences and epistemologies should be central to efforts to counter capitalism and access alternative ways of being for environmentally sustainable futures.

Reflecting on a just transition to environmentally sustainable futures, Osborne [43] argues that the need for collective care and support for living in a world that is hostile to your existence is work already underway amongst persons with disabilities, Indigenous peoples, and other historically marginalized groups, asserting that this work can be harnessed for positive social, economic, and environmental change. Likewise, Hamraie [36] suggests that a thriving ecosystem requires increased care and attention to biological and human diversity and all forms of marginal life. As such, the diversity of, and historical marginalization experienced by, persons with disabilities should be central to any environmentally sustainable design. Hamraie argues that a crucial part of a theoretically and politically just transition is a rejection of “neoliberal sustainability politics” and “the recognition of life as livable beyond economic calculations regarding extraction or productivity”.

Fenney Salkeld [35] argued that most concepts of sustainability “seem to share an individualistic understanding of humanity and prize a traditional view of independence – that is, doing things without assistance [in environmental sustainability efforts]”. This contrasts with shared understandings of collectivism and the interdependence of humanity espoused by the disability movement. To advance disability inclusion, Fenney-Salkeld recommends the framework of Just Sustainability, which focuses on “the need to ensure a better quality of life for all, now and into the future, in a just and equitable manner, whilst living within the limits of supporting ecosystems” [4]. Fenney Salkeld [35] identifies this as a potentially useful framework because it “allows disability as an issue of social justice to be neatly combined with concern for environmental sustainability” and incorporates social and environmental issues, while taking economic factors into account in terms of inequalities and the ability to participate in environmental sustainability efforts.

This literature recognizes the tensions between conceptualizing anti-capitalist approaches and built economic realities. These tensions are couched in hegemony to advance inclusion in capitalist modes of production and commodified social relations, the challenges of capitalist realism [50], and the threat of purity politics [36, 43]. Hamraie and Osborne acknowledge that re-imagining the status quo is insufficient for preventing oppressive practices and that complete disengagement with capitalism is rarely tenable. To advance disability-inclusive political and economic transformation, Osborne suggests it is critical we understand the interactions between, and co-constitution of, capitalism, labour conditions and relations, and climate change. This understanding can inform praxis and interventions that contribute to climate justice and weaken the systems that have produced our current crisis.

Larrington-Spencer et al. [39] also argued that much work in the field of environmental studies challenges how we imagine disability inclusion, noting that “the disabled body is positioned as a cautionary tale, an outcome of accident, of environmental degradation, rather than a whole human being with interest in environmental damage beyond their own body”. Larrington-Spencer and Fenney Salkeld [35] connect the profound socioeconomic poverty of persons with disabilities and their restricted financial capacity to access alternative forms of energy (e.g., solar power, electric vehicles), in addition to the inaccessibility of many environmentally sustainable activities (e.g., inaccessible public transport, local shops, and community gardens), which entrenches their positionality as non-actors in a green economy. As such, disability is conveyed as a negative outcome of climate change, rather than as integral in the cause for climate justice.

Two additional articles critically explored the capabilities of persons with disabilities in just transition policy measures. Wood and Roelich [49] drew from Nussbaum’s capabilities approach [51] to identify the regressive impacts of carbon taxes, energy policy and carbon trading on people living with low income, including persons with disabilities. The authors argue that the

exclusion of persons with disabilities in climate policy formulation and other democratic processes leads to policies that fail to account for their concerns and disproportionately impact them in comparison to other groups who have a greater capability to be politically active. The authors conclude that, “If our motivation to mitigate climate change is found in climate change’s detrimental impact on human well-being, then our concern should be extended to those vulnerable groups whose well-being is risked as a result of misguided climate mitigation” [49]. They argue that well-being and human capabilities need not be tied to fossil fuels permanently, but that these capabilities can be ensured by more inclusive solutions.

King and Gregg [38] further argued that the exclusion of persons with disabilities from discussions of just transition measures not only results in heightening their vulnerability, but also deprives everyone of the valuable insight of persons with disabilities into the complex issue of climate change. They draw from Wolbring’s ableism framework [52] to argue that decision makers “involved in the shaping of ecological discourses exhibit ability expectations (eco-ability expectations) and forms of ableism (eco-ableism) that influence how they define ecological problems and solutions to the problem and, therefore, whom they invite to the table as stakeholders and knowledge producers” [38]. In this way, persons with disabilities are excluded from the discourse and means to take part in action to ameliorate climate change. They argued that lessons can be learned from successful engagement tactics and approaches to influence policy in the history of the disability rights movement, including the history of the CRPD, which was created by and for persons with disabilities and obliges states to actively include persons with disabilities in decision-making on issues affecting their lives.

Reflecting on the CRPD, Jodoin et al. [7] and Stein and Stein [45] proposed a human rights approach for a disability-inclusive green economy. Jodoin et al. argue that the inaccessibility of climate mitigation policies, programs, and projects undercuts their effectiveness and reinforces social inequities. The lack of access limits the potential contributions of persons with disabilities in the transition to a low-carbon economy. They suggest states must go “beyond merely preventing and minimizing the impacts of climate mitigation on persons with disabilities [and] ensure that their efforts to decarbonize their economies are carried out in ways that vindicate disability rights”.

Stein and Stein [45] further argued against the vulnerability narrative also addressed by Fenney-Salkeld and others [35, 39]. Stein and Stein argued that States are obligated to ensure the right to participation of persons with disabilities as stakeholders in the creation of climate adaptation and mitigation measures. Persons with disabilities are best positioned to develop strategies and remove barriers based on their lived experience, situating themselves as change agents rather than as part of a voiceless “vulnerable” population. Moreover, “Empowering disabled people as sustainable economic actors is a powerful means to overcome the potential negative effects of climate change”. However, stubborn challenges remain, as states question whether they have the resources to ensure disability inclusion. Stein and Stein argued that the correct question “is whether they can afford not to include their largest minority population”. Stein and Stein argued for a paradigm shift in climate financing whereby funds are directed only toward a socially and environmentally sustainable future, and not toward counter-productive and costlier-to-fix applications such as inaccessible and unsustainable buildings, and unsustainable agricultural practices.

### 3.2 Persons with Disabilities as Workers

Nine articles discussed the inclusion of persons with disabilities as workers in a green economy and green jobs. Two of these articles focused on inclusive employment in “decent green jobs” in Canada and the USA [18, 47]. Decent green jobs were defined as well-paid jobs that contribute to climate adaptation, reducing greenhouse gas emissions, preserving or restoring the environment, or reducing energy usage while addressing poverty reduction and workplace safety. Two additional articles presented practical examples of disability-inclusive employment within sustainable business models in organizations in France and Spain [31, 34]. These articles examined the characteristics of “innovative” organizations that employ a significant number of persons with disabilities; operate in the health and social care, and fourth sectors (The fourth sector was defined as an emerging sector of the economy which consists of “for-benefit” organizations that combine market-based approaches of the private sector with the social and environmental aims of the public and non-profit sectors) and aim to achieve a triple bottom line in terms of economic, environmental and social performance. Two articles focused on the right to work and employment [7], and the need for anti-discriminatory “green” contracts, government employment opportunities, and training [45]. Other articles explored the role of accessibility in corporate sustainability reporting in Europe [48]; the potential of opportunities in the environmental sector in the USA [37]; and the overlapping vulnerabilities of workers in the electronics recycling industry in high-income countries [33].

Overall, these articles suggest that persons with disabilities represent largely untapped potential for the advancement of a socially inclusive green economy. Alonso-Martínez et al. [34] found that firms employing a substantial number of workers with disabilities and integrating diverse worker knowledge into their business model reinforced the sustainability of their organizations. Similarly, Angelini et al. [31] found that organizations employing persons with disabilities with a mandate to promote social, economic and environmental sustainability were more likely to engage disruptive strategies that change customer values and value chains to create social change. Yet, there are few examples of green jobs for persons with disabilities. This exclusion is described as a missed opportunity to capture diverse knowledge and innovative thinking.

To create opportunities, the literature suggests building inter- and intra-sectoral (public, private and civil sectors) relationships between persons with disabilities, educational and training institutions, employers and local government representatives [18, 31, 47]. These efforts should use participatory processes to strategically examine barriers and gaps, design training to fill those gaps, and seize opportunities for employment in green jobs in local labour markets. These efforts must also rectify the historical and current exclusion and marginalization of persons with disabilities through the advancement of inclusive education [37].

This literature also calls for financial incentives and tax benefits to encourage the employment of persons with disabilities in green jobs and industries [18, 31, 34, 45, 47]. Two articles call for “green social contracts” that create green job opportunities via subsidized apprenticeships and training programs, as well as procurement strategies and quotas that mandate employment of persons with disabilities [18, 47]. At the same time, Angelini et al. [31] argue that dependence on subsidies should be reduced

to promote “the emergence of a new image of true diversity”. At an organizational level, this includes promoting internal norms to institutionalize inclusion “and guarantee that economic targets, as well as the desired social and environmental outcomes, are achieved” [34].

In line with the CRPD, advancing inclusion must also advance the right to decent and safe working conditions for all, particularly in new green industries with emerging and unknown hazards and risks [7, 18, 33]. Moreover, these articles suggest that existing barriers and challenges to decent work could be exacerbated by the decline of different economic sectors and an increase in unemployment because of severe weather events, increased temperatures, and subsequent unsafe working conditions [7, 33]. The literature calls for increased government intervention and support for human rights, inclusive/universal design, and accessibility embedded in workforce development processes and workplaces. It is also critical to monitor and examine the demographic representation of workers in various green industries and jobs to identify areas of exclusion and inclusion [18, 47], as well as assess the potential over-representation of persons with disabilities in unsafe, precarious, low-paying jobs [33].

The potential for sustainable business models arose as a sub-theme in the literature [34, 44, 48]. These models were described in terms of economic, social, and environmental performance and highlight the unmet opportunities to strategically embed disability inclusion and accessibility into sustainable business development. However, the literature also indicates that disability issues are often relegated to a focus on social sustainability in terms of corporate charity and diversity hiring and largely neglected in corporate reporting that emphasizes economic and environmental sustainability [48]. Thus, there is a disconnect between policies and practices of social, economic and environmental sustainability within organizations, and the inclusion of persons with disabilities as workers and consumers. Alonso-Martínez et al. [34] conclude that “although many firms from different sectors have increased their social and environmental activities to achieve triple bottom line outcomes over the past few years, most of them have just paid more attention to these problems while continuing to operate as traditional firms”. As such, they call on fourth sector firms to engage in more “non-traditional” operations to advance disability inclusion and social, economic and environmental sustainability in tandem.

### 3.3 Persons with Disabilities as Consumers

Six articles discussed the exclusion of consumers with disabilities in the circular economy and the development of sustainable forms of energy and energy conservation. These discussions were linked to existing poverty among persons with disabilities and their exclusion from climate policy formulation and just transition agendas.

Two of these articles discussed the advancement of assistive technology (AT) provision in the circular economy [32, 42]. Both articles argued that there are co-benefits for the environment and disabled users of AT – namely, the socioeconomic benefits of making more devices available and less expensive for users, and the environmental benefits of reducing the number of devices being discarded as landfill waste. Barbet et al. [32] and Oldfrey et al. [42] argue that building local capacity for AT innovation and production could have a knock-on effect of providing economic opportunity for persons with disabilities to develop their ideas and prototype and test devices to be highly context specific and appropriate for the specific climate. However, many national health insurance systems do not cover second-hand AT devices, which discourages recycling and the advancement of circular business models. They argue for increased government program and policy supports for second-hand AT. In their review of AT reuse programs in various countries of the Global North, Barbet et al. found that public subsidies played a crucial role in the launch of projects, providing substantial resources for initial investments, and were driven by the principles of the social and solidarity economy and pursued a collective interest.

Morris and Piovesan [41] described how university students in Erie County, USA, recycled old crayons to create adapted crayons for local school children with disabilities. Starting from the expressed needs and interests of children with disabilities, the project was an example of innovative practice as it exposed university students to all the components of a “green economy” (i.e., environmental, societal, economical). Children with disabilities could also participate in the recycling and design process.

In another local example from Spain, Sanz et al. [44] presented opportunities for the inclusion of accessibility criteria in the design of “sustainable and environmentally friendly tourism infrastructures and services”. They provided an overview of the economic and social benefits of attracting customers with disabilities with a sustainable business model. Using hotels as an example, they highlighted the large energy expenditures in infrastructure and services and provided recommendations to involve guests with disabilities in water and energy conservation through accessible designs of automatic taps, lowering the height of light switches, and braille descriptions on waste bins. With changing demographics and aging populations, the authors noted that, “tourism entities should include the accessibility variable in their infrastructures and services if they want to maintain themselves in the market and contribute to developing a sustainable and environmentally friendly tourism [industry]”.

Two additional articles focused on issues of energy poverty in relation to a just transition to a green economy. Middlemiss [40] summarized empirical literature on the experience of energy poverty in the Global North, characterizing the life experiences of those who do not have sufficient access to energy services (light, heat, warmth, cooling, etc.) to live a decent life. The article shows how persons with disabilities experiencing high levels of socioeconomic poverty are more likely to experience energy poverty. They found, a just transition is “highly risky for energy-poor households, who enter into the transition at a disadvantage. . . This is a matter of recognizing historical injustice, including the drivers of that injustice, understanding how that has affected experiences in the present, and moving toward a more restorative approach.”. Middlemiss suggests there are additional concerns about how national definitions of disability can shape energy poverty status and subsequent access to benefits and employment for persons with disabilities in a just transition.

Another discussion of energy poverty captured qualitative data on the lived experiences of persons with disabilities in Iceland [46]. Similar to Middlemiss [40], a key implication of this primary research was that understanding energy poverty requires a broader understanding of socioeconomic poverty and its causes, as well as an understanding of the causes and nature of inequality. In this way, the lived experiences of energy poverty among persons with disabilities must be understood and rectified

to realize a just transition to a green economy.

#### 4 Discussion

Our findings confirm there is a dearth of literature on disability inclusion in the green economy. Out of 4,311 abstracts obtained, only 21 discussed disability issues in relation to the green economy. Of these, eight articles offered conceptual understandings of disability exclusion and inclusion; nine discussed persons with disabilities as workers in the green economy and green jobs; and six reflected on considerations of persons with disabilities as consumers in the circular economy and just transition.

Most texts drew from a critical or human rights model of disability to emphasize the systemic exclusion of persons with disabilities and identify the existing social, economic, and political challenges and barriers to inclusion. These texts described how challenges and barriers must be dismantled to create opportunities for inclusion and enhance the capabilities of persons with disabilities but did not use the term “green economy” *per se*. Rather, they offer critiques of current capitalist and neoliberal political economies, and “traditional” business models, instead envisioning a “low carbon economy”, “sustainable business models”, or “environmentally sustainable futures”. This shift is also described in terms of climate and environmental justice, just transition and circular economies.

In relation to the distributive, recognition and procedural justice dimensions of environmental justice, the literature strongly suggests that persons with disabilities have been diminished, marginalized, excluded or ignored in green economic and low-carbon development efforts. The costs and benefits have been unevenly distributed such that persons with disabilities are disproportionately impacted by climate change and have been largely excluded from the socioeconomic benefits of climate actions. Persons with disabilities have been excluded or ignored in relevant climate policy and just transition measures. This exclusion was discussed as a missed opportunity to harness the creative potential and work already underway by persons with disabilities and other historically marginalized groups to engage in collective care and support for living in a hostile world.

Currently, the literature is largely hypothetical and conceptual, focusing on what a disability-inclusive green economy should look like in the Global North. In general, sophisticated empirical studies are lacking. Our review found only three articles that included practical examples of inclusion with a focus on “green jobs” [31, 34, 47]. However, this literature does not sufficiently examine dimensions of employment quality and decent work, such as adequacy of income and benefits, socio-cultural environments at work, work-role status, social protection, etc. [53]. There is also a lack of research addressing these issues from an intersectional perspective to reflect the diversity of persons with disabilities in terms of gender, race, age and other forms of equality and equity. Thus, the literature would benefit from more theoretically informed empirical research that examines and evaluates the challenges and efficacy of inclusive green economic activities in relevant real-world settings. Future research must be initiated and led by a diversity of voices from disability communities, including those who have lived experience of other forms of privilege or oppression tied to sex, age, race, gender, sexual orientation, colonialism, class and caste.

This review indicates that a critical disability theory approach can be useful to inform the principles, values and opportunities for a disability-inclusive green economy. Critical disability theory illuminates the challenges and barriers in our current political and economic systems to the inclusion of persons with disabilities and highlights the need for radical transformation, much like the concepts and discourses underpinning the green economy. Similarly, critical disability theory refers to a diverse, interdisciplinary set of theoretical approaches that is intended to inform activism and praxis for transformative social change [54]. The analyses included in this review broaden critical disability theoretical development to include considerations of biodiversity, non-human beings, and the earth, but this expansion is still very much in its infancy. Moreover, the current ambiguity of green economy concepts [55] could open up meaningful discussions between disability and environmental studies scholars, persons with disabilities and their representative organizations, unions, environmentalists, government, and employers on how to mitigate the social fallout and consequences from necessary environmental policy changes and also generate opportunities for economic inclusion.

The literature suggests that while it is critical to recognize the disproportionate impacts of climate change on persons with disabilities, there is a need for a shift away from a focus on vulnerability toward a vision of persons with disabilities as agents of change. All included texts suggest that disabled experiences and epistemologies should be central to the design, planning, and implementation of the emerging green economy in order to harness the creativity and capabilities of persons with disabilities. Persons with disabilities are key sources of knowledge and lived experience of how to thrive and survive in a world that is becoming increasingly hostile to our existence [31, 35, 49]. A green economy should thus view and treat persons with disabilities as integral, political, and valuable citizens, workers, and consumers.

The literature indicates that there are systemic challenges and barriers to inclusion within the current structure of work and employment, which are compounded by socioeconomic and energy poverty. Individualistic responses to climate change, such as through consumption choices and the disincentivization of certain activities, may negatively impact certain groups more than others, including persons with disabilities. This is because of social, physical, and economic barriers that restrict choice and autonomy. Existing barriers to political participation and other democratic processes also lead to the formulation of laws and policies that fail to account for the concerns of persons with disabilities and disproportionately impact them in comparison to other groups who have a greater capability to be politically active.

Implementing a just transition to a green economy will require an integrated mix of employment standards, social protection, skills development, and attitudinal transformation to create an enabling labour market for green jobs and equitable work opportunities to proliferate. The literature identifies opportunities through sustainable business models that employ a significant number of employees with disabilities and increased knowledge of the connections between disability and economic, environmental, and social sustainability.

Overall, there is a need to shift away from traditional *laissez-faire* capitalist and neoliberal business models and economics.



This shift was described in both transformational and strong discourses [56]. Transformational approaches emphasize an increased role for the state in the development of green enterprises [18, 47], an integrated and increased focus on social sustainability [48], human rights [7, 45], and more decent and inclusive employment relations [33, 34]. Strong discourses included explicit calls to abandon the growth paradigm. Conceptually speaking, this critical literature indicates that a disability-inclusive green economy aligns well with anti-capitalist approaches based on principles of designing for interdependence and collective care [36, 43] rather than segregation and individualism, and an increased focus on equity and just sustainability [35, 39]. However, the literature problematizes the tension between these strong approaches and the built realities of capitalist modes of production and commodified social relations, the challenges of capitalist realism, and the threat of purity politics [36, 43].

Finally, there are strengths and limitations to this scoping review. The review used an established, rigorous scoping review methodology and was conducted by a team with both content and methodological expertise. However, given the nature of this study, we did not include a quality appraisal component in our analysis and therefore are unable to make strong statements about the quality of the texts and evidence gathered. Nonetheless, the review provides a solid understanding of the breadth and depth of the literature. Given that it is a modest literature with mostly conceptual studies, it seems premature to consider quality assessment until the evidence base grows to include more evaluative studies. A further limitation is that we only reviewed articles in English with a focus on the Global North and therefore have a potential geographic and language bias. Future research should explore the challenges and opportunities for disability inclusion in the development of green economies in low- and middle-income countries in the Global South and Eastern Europe, including China and Russia, as well as studies published in other languages. This is particularly critical as the majority (80%) of persons with disabilities live in the Global South and in countries that experience higher rates of poverty and disproportionate impacts of climate change [5, 10].

## 5 Conclusion

This scoping review has highlighted several important themes about disability in relation to the green economy. It serves as a source of information on the scope of the scholarly literature and provides insights into the challenges, barriers and opportunities for disability inclusion in a green economy, as well as important gaps in the scholarly literature.

Taken together, the texts included in this review indicate that without an explicit focus on the root causes of exclusion for those at the furthest margins of society, the goals of an inclusive and just transition to a socially, economically and environmentally sustainable world will remain unreachable. A disability-inclusive green economy should be inextricably tied to the principles and articles of the CRPD, and a critical disability perspective to advance the well-being and capabilities of diverse persons with disabilities by breaking down physical, architectural, technological and attitudinal barriers and simultaneously promoting social, political, economic and environmental accessibility and inclusion.

The literature raises critical questions about the potential of a disability-inclusive green economy. The literature identifies entrenched tensions between the current state of exclusion and the possibilities for a more inclusive and environmentally sustainable economy. Unless there is a radical transformative change in the economy and the labour market, the challenges and barriers facing persons with disabilities will remain. While there are questions about what that transformation will look like, the literature clearly indicates that persons with disabilities must be included in its design, implementation, monitoring, and evaluation.

As the green economy is emerging, there is an opportunity now to make it inclusive – to re-conceptualize, and (re)present the image of disability. In research and practice, there is a need to shift away from a focus on vulnerability toward a vision of persons with disabilities as agents of change. In terms of policy, persons with disabilities must be included in equity-based co-creation processes and multistakeholder governance. There is a need for mandates and regulations/requirements for disability inclusion in procurement, employment, and just transition measures to support the inclusion of persons with disabilities as workers and consumers. Financial incentives/wage subsidies for businesses and employers may be implemented as a temporary measure coupled with investment in participatory/inclusive processes, knowledge production, dissemination, and mobilization to increase awareness of the connections between disability and environmental justice. This will require cross-sector and cross-movement organizing, to advance the co-benefits of collaborative and collective economic development processes that consciously and actively resist an individualized approach and advance transformative social, environmental and economic change.

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Not applicable.

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## Conflicts of Interest

The authors declare no conflict of interest.

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