

Embodying Justice in the Built Environment: Transatlantic Reflections on Carbon Neutrality, Circularity, and Justice

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Abstract

Unjust practices have shaped the built environment, involving land dispossession, exclusionary planning and development, exploitative labor practices, and environmentally harmful material building cycles. These practices have (re)produced material and spatial inequities. Embodying Justice in the Built Environment is a framework to answer the question: How can planners, government agencies, and communities meaningfully centre justice and equity in working towards carbon neutrality and reducing embodied carbon? Developed through collaborative and case study methods, this research produced a series of guides and workbooks to support local governments and community organizations in addressing 1) Circularity and Waste and 2) Just and Equitable Land Use Transitions. Though rooted in North American cases, the framework offers insights for educators, policy-makers, and planners in other contexts.

Keywords: Embodied carbon, carbon neutrality, circularity, planning practice, justice, land use, waste

Introduction: Embodying Justice in Building Carbon-Neutral Futures

In recent years, national and local governments, along with nongovernmental organizations (NGOs), have increasingly focused on decarbonisation—particularly on reducing greenhouse gas (GHG) emissions from buildings and urban development. In Europe, and to a growing extent in North America, efforts have shifted toward addressing embodied carbon: the GHG emissions associated with a building's entire life cycle, including material extraction, manufacturing, transportation, construction, maintenance, and end-of-life processes. While policies targeting embodied carbon are gaining momentum as part of broader climate action, they often overlook the social, spatial, and material legacies that shape, enable, or constrain these transitions. The built environment is a system of emissions and infrastructures, and a reflection of deep-seated and layered injustices. Historical and ongoing practices—such as land dispossession, exclusionary zoning, the use of toxic materials, and demolition-driven redevelopment—continue to determine who has access to land, resources, and decision-making power (Corner, 1999; Escobar, 2018). In addition, injustices in land use have been compounded with historical and contemporary housing and transportation policies that have severely impacted racialized and minoritized communities in North America (Bullard, Johnson and Torres, 2004; Desmond and Bell, 2015; Caverly, 2022; Bronin, 2024; Millard-Ball et al., 2024). As the push for carbon neutrality accelerates, the question is not just how to reduce emissions, but how to do so justly.

This paper introduces the Embodying Justice framework—a collaborative initiative involving researchers, local authorities, and community partners that seeks to centre justice and equity in decarbonisation strategies. Developed through applied research, the framework sets out guiding principles, domains of justice, and reflective questions with corresponding actions to support planners, policymakers, and scholars working at the intersection of climate and equity. From the Embodying Justice framework two interconnected research projects have

been produced: one focused on circularity, waste, and building and building material reuse; the other on land use transitions. Despite their differing areas of emphasis, both raise a shared concern: that without deliberate attention to social context and historical harm, low-carbon transitions risk reinforcing patterns of exclusion and inequality. A key insight from this work is that embodying justice demands a move beyond technocratic metrics and calculative logics that solely tend to the reduction of carbon. This framework calls for approaches grounded in social and material systems of repair—anchored in inclusive, reparative, and community-led planning.

The two *Embodying Justice in the Built Environment* resources were developed within a North American context, in collaboration with the international NGO the Carbon Neutral Cities Alliance (CNCA) and local officials from cities in the United States and Canada. Grounded in participatory research with community leaders across New York State, this work was carried out in partnership with the Circularity, Reuse, and Zero Waste Development (CROWD) network. The resulting outputs comprise two guides, each accompanied by workbooks, designed to support communities in reflecting on and implementing justice-centred planning practices (see, for example, Minner et al., 2024). In the context of a climate emergency—and amid a political environment in the United States increasingly hostile to both climate action and diversity, equity, and inclusion—this work offers practical tools for local authorities pursuing just transitions towards circular economies and equitable land use.

This paper offers an overview of how these resources were developed, outlines key justice considerations embedded in the *Embodying Justice* framework, and shares insights from their development. The following section introduces foundational and emerging literature related to embodied carbon emissions and intersections with structural injustices. Next, we describe the research methods used. We then present the *Embodying Justice* framework, identifying its core areas of intervention and practical resources it offers for planners, scholars, and communities. We discuss the format of the guides and workbooks and how they are intended to be used. In the discussion, we note that although grounded in North American case studies, the framework is intended to be adaptable to other contexts. This paper concludes with how these resources aimed to offering scaffolds for addressing injustices in the built environment. Through their use, it is hoped that government agencies can realize means of situated, collaborative, and accountable action that pairs the reduction of carbon emissions with the systematic dismantling of injustices.

Embodied Carbon Emissions and Structural Injustices

European cities have emerged as leaders in advancing circular and sustainable economies, implementing material reuse strategies and designing for disassembly (see, for example, Heisel et al., 2022; Vullings et al., 2024; Williams, 2021). Many have also adopted embodied carbon policies to reduce emissions embedded in building materials and processes. By contrast, progress in North America has been more fragmented. Only a few municipal and county governments in Canada and the United States have adopted regulations to address embodied carbon (CROWD, 2023; Winters, 2025).

Efforts to integrate justice and equity into urban policy are evident in both European and North American contexts. For example, the World Green Building Council (WGBC) has proposed a framework for addressing the social aspects of sustainability, noting: “The impacts of the built environment as an industry... go far beyond the users of individual assets—the sector impacts upon human rights at every stage of the building and construction life cycle” (World Green Building Council, 2023, p. 3). The WGBC proposes a broad framework in four scopes to “consider workers, occupants, users and entire communities” (ibid.) within the building industry, with building users and the site of construction, within surrounding communities, and throughout supply and value chains.

Recent efforts by professional organisations have also helped to clarify how planning and design practices are implicated in historical and ongoing harm. The American Planning Association *Equity in Zoning Policy Guide* underscores that zoning is a tool shaped by racialised exclusion, displacement, and uneven development. The guide identifies zoning as a contributor to land use and environmental injustice while calling for reparative approaches that centre procedural inclusion, redistribution of benefits and burdens, and address legacies of harm through policy reform and accountability (APA, 2024, pp. 10-12).

Parallel contributions from the American Institute of Architects (AIA) emphasise that justice must be embedded throughout the life cycle of the built environment, from the extraction of materials to labour conditions, construction decisions, and long-term stewardship. In its “Justice in the Built Environment” supplement, the AIA frames equity as a relational and process-oriented commitment. The guide asks questions such as: “Are we making a discernible difference in the particular population it’s designed for? “What does it look like when we center justice?” and “Is it possible to envision a system without dominance, where there is space for everyone to thrive equally?” (AIA, 2021).

Together, these resources produced by professional organizations sit at the forefront of planning and architectural practice in the US, reinforcing shared recognition that equity and justice are an ethical imperative, and that the design professions must address the injustices both past and present. These resources acknowledge that a justice-oriented planning and design must address the material and spatial processes they guide, both in terms of their process and outcomes, working toward both practices of collaboration and structures redress.

These are important directions for planning, design, and allied professions. However, there remains a notable gap in the literature addressing embodied carbon reduction and structural injustice. As noted, embodied carbon refers to the greenhouse gas emissions associated with a building’s entire lifecycle—from material extraction and processing through to construction, maintenance, and eventual demolition (NYCEDC Circular Construction Guidelines, 2024). Embodied carbon emissions are not incidental; they often represent a substantial proportion of a building’s total climate impact (Huang, 2018; Liboiron, 2021). Nor are they produced by neutral systems. They are reflect “embedded injustices” —a built environment that is a produced from “[land] dispossession, denial of land rights, discriminatory land use, zoning, and urban renewal policies, as well as harmful material extraction and toxic production processes, wasteful construction and consumption practices” (Minner et al., 2024, pp. 2; Taylor, 2014). The same systems that generate embodied emissions also shape access to land, housing, health, and generational wealth into the future. Globally, material supply chains—spanning cement, timber, and increasingly, renewable energy components like solar panels and batteries—have relied on forced labour, toxic exposures, and unsustainable extraction practices (Grace Farms Foundation, 2022). Such burdens disproportionately affect communities of colour and low-income populations around the world. In the US and Canada, zoning ordinances and urban renewal programmes have contributed to racialised displacement, while redlining, land transfers, and highway construction have historically dismantled neighbourhoods of colour (Hirt, 2014; Poe et al., 2025; Silver 1997). These injustices are not confined to the past; they are reproduced today through cycles of demolition and development. Moreover, carbon reduction policies that ignore local context may intensify inequality, accelerating gentrification, displacing vulnerable populations, and favouring high-tech solutions over community-led ones (Liboiron, 2021, p. 115).

The cumulative nature of harm—across zoning, building, maintenance, and demolition—necessitates a systemic and situated response. Amid developments in embodied carbon policies and growing inequalities, justice should be understood as foundational and place-based, not an optional add-on to climate mitigation strategies. The Embodying Justice guides rest on this principle. Informed by community partners, local government leaders, and practitioners, they assert that climate action must begin with a clear understanding of the historical, material, and policy conditions that shape both emissions and equity. Embodied carbon is both a technical issue and a repository of priorities, exclusions, and decisions that accumulate across time and space. A just response demands an equally expansive framework. The Embodying Justice framework was produced as an aid for recognising, redressing, and transforming these embedded harms through climate action.

Methods: Developing the Embodying Justice Framework

The Embodying Justice framework was developed through a multi-phase, collaborative process involving university researchers, municipal staff, and community partners across the United States. Led by teams from Cornell University and the University of Washington, the project began with a systematic review of policy frameworks promoted by the Carbon Neutral Cities Alliance (CNCA), with a focus on reducing embodied carbon through circularity, waste management, and land use regulation (Carbon Neutral Cities Alliance and One Click LCA, 2020). The research analysed building life cycles and governance systems related to land, care, and transition, conducting

interviews with local governments and community organisations to build context-specific case studies.

The team first assessed documents, guidance, and case studies concerning embodied carbon, deconstruction, reuse, zoning, and climate planning—reviewing carbon accounting tools and local planning documents with an eye toward both policy design and implementation challenges. Subsequently, we focused on producing practice stories grounded in North American cities (USA and Canada) to understand how justice was or was not emerging in their climate work, and to identify areas for further development. Interviews for Phase I on Circularity and Waste were conducted with contacts at local governments and community organizations at the City of San Antonio Office of Historic Preservation (Texas, USA); The Esperanza Peace and Justice Center (a community-based organization, Texas, USA); Re:Purpose Savannah (Georgia, USA); Bureau of Development Services (Oregon, USA); Austin Office of Historic Preservation (Texas, USA); BLOCK Architects and Facing Homelessness (Washington, USA); Black Women Build-Baltimore (Maryland, USA); Better Futures Minnesota (Minnesota, USA); and Green Step Cities Program (Minnesota, USA).

In Phase II on Just Land Use Transitions, interviews are being conducted with contacts associated with the City of Vancouver, B.C., Rondo Community Land Trust, Beacon Hill Food Forest Non-Profit, and Detroit Planning and Development. The final list of interviews for the second phase will be available at a later date, when the Phase II guide and workbook have been finalised.

In addition, the research team has met with another research team in Barcelona, Spain, led by Isabelle Anguelovski. Additional informal interviews with researchers at Tampere, Finland, related to circularity in the built environment have also informed this paper.

Embodying Justice Framework Structure and Principles

Through this research, two final guides were produced: 1) circularity and waste management, and 2) land use policies and zoning regulations (Carbon Neutral Cities Alliance and One Click LCA, 2020). Each guide outlines key justice principles, a workbook for reflection and implementation, and locally grounded practice stories drawn from interviews, workshops, and city-specific policy review. Together, they were crafted to offer practical tools that reflect shared goals while allowing for contextual adaptation.

Each workbook is grounded in five interrelated justice principles:

Justice is reparative. It concerns itself with making right what has been wronged, reconnecting what has been broken, and balancing the imbalanced.

Justice is fair. It equitably distributes social, cultural, political, economic, and environmental benefits and burdens.

Justice is community-driven. It centres historically oppressed and marginalised communities in a collaborative and inclusive process to move toward just futures.

Justice is placed. It is grounded in the specific community context in which it is invoked, rather than an abstract concept.

Justice is not a singular endpoint. It is a continuing process of reflection, acknowledgment, and action.

The framework is organised around several interrelated dimensions: acknowledging and addressing historical harm, ensuring inclusive and fair decision-making, recognising local knowledge, culture, and spatial histories, and building capacity and accountability in implementation. These categories, referred to as the “J’s,” guided the selection of questions and structures for the workbooks and reflect an effort to move from principles into applied planning reflections and support. Throughout the process, the research team continually checked in to strike a balance between offering general guidance and reflecting insights specific to real places. Local govern-

ments expressed a need for flexible, adaptable resources rather than prescriptive checklists. This process also showed the importance of starting with shared language before introducing technical tools. This grew into the inclusion of worksheets, reflection prompts, and open-ended guiding questions rather than fixed policy recommendations.

The resulting guides are structured around a shared framework: five justice principles (reparative, fair, community-driven, placed, and ongoing), and justice domains or J's that are described as follows:

J1 Community Impacts

- Map a strategy's impact across communities (people, places, spaces, ecologies), ensuring equitable distribution of benefits, health, and well-being for priority communities.
- Examine how a strategy's design and implementation reflect priority communities' values, needs, and cultures.
- Consider a strategy's potential to redress past and ongoing harm.

J2 Economic Impacts

- Map a strategy's impact on uneven development and local economies, ensuring equitable distribution of benefits for priority communities.
- Examine a strategy's relationship with commercialization, cost, and affordability across communities, identifying opportunities to balance local economies.
- Consider a strategy's potential to develop community-driven approaches for economic growth that aim to redress the impact of extractive development.

J3 Labor and Workforce

- Examine a strategy's impact on workers' health and well-being, ensuring equitable distribution of benefits for priority laborers.
- Identify how a strategy can support balancing opportunities and access to the workforce for priority communities that have been unjustly excluded.
- Consider a strategy's potential to invest in worker agency in ways that lead to a more just workplace and field.

J4 Historical Context

- Examine how legacies of injustice and resistance can influence a strategy's design and implementation in ways that inform a more just approach in the present and future.
- Contextualize the strategy in local histories through an in-depth reflective process that centers priority communities to make right what has been wronged.
- Consider a strategy's potential to be situated in place by uplifting local stories of people, places, and sites historically abandoned or undervalued.

J5 Community Engagement and Involvement

- Examine a strategy's transparency and inclusiveness, ensuring priority communities have equitable access to knowledge, engagement, and opportunities.
- Promote processes that allow a strategy to be co-produced with priority communities through open dialogue.
- Consider a strategy's potential to invest in community-driven approaches that honor community knowledge and values and repair past and ongoing harms.

J6 Transportation Equity and Access

- Examine a strategy's impact on transportation access and mobility, ensuring equitable distribution of benefits and protection from harms.
- Promote in-depth reflective processes for determining how the strategy impacts priority communities'

well-being and access to opportunities.

- Consider a strategy's potential to repair past harms from the planning and provision of transportation facilities and infrastructure.

J7 Housing Security, Equity, and Access

- Examine a strategy's impact on housing security and access, ensuring equitable distribution of benefits and protection from displacement.
- Promote processes that welcome new residents while fostering priority communities' long-term connections to place.
- Consider a strategy's potential to repair past harms from the private and public provision of housing.

The project sought to illustrate the Justice Considerations (Js) through reflective questions and case studies tied to practical interventions. This structure is aimed at supporting cities and organisations in contextualizing justice. The reflective design of the workbooks was informed by an iterative process of dialogue, testing, and revision with municipal and community collaborators. The format is described in the next section.

Applying Justice to Practice: Format of the Workbooks

Both phases of the project have involved creating workbooks to make potentially abstract principles more concrete and actionable for local governments. These workbooks demonstrate how justice-oriented approaches can be applied in practice and are structured around two key components: question sets and practice stories. Question sets were designed to support dialogue—particularly cross-agency conversations and communication between local governments and community organisations—and encourage direct work toward justice with priority communities. The question sets are not intended to be prescriptive tools, but rather as prompts to spark reflection, analysis, and collaborative action. Figure 1 provides an example from Phase 1 of the project, which focused on circularity and waste (discussed in more detail in the following section).

These guiding prompts throughout the workbooks are aimed at helping unpack:

- How does a policy, practice, or program redress past and ongoing harms?
- Who benefits from them, and who is at risk of being excluded?
- How do they address local histories of injustices related to the built environment?

Practice stories offer brief case studies of local governments or community organisations implementing equity or justice-focused strategies that support lower embodied carbon or, more broadly, climate action. These stories, developed through interviews, highlight successful efforts to embed justice into practice. In Phase 2, this format was expanded to include a question-and-response structure. This evolution supports a deeper understanding of each case and encourages readers to reflect on how similar strategies might apply in their own contexts. In a sense, the workbook structure mimics the kind of problem sets that one might encounter in a textbook, but turns them on their head. Instead of practicing rote mathematics, users gain practice applying the Js to their local context. Thus, the new format of practice stories in the second workbook, are aimed at creating “story problems,” that again, require contextual reasoning.

	J1	J2	J3	J4	J5
1. How are priority populations identified and their needs and values included in MPR strategies? - Consider community-led mapping of areas negatively impacted by concentrated demolition activity. - Conduct a neighborhood audit of building conditions, ownership patterns, and other indicators to understand potential root causes of injustices related to MPR needs in the built environment. Notes:					
2. How do public and private investments in MPR ensure that benefits and burdens are distributed equitably? Consider incentives for businesses in priority communities, development of affordable housing in existing building stock, support for entrepreneurship, access and potential negative impact of energy retrofits and displacement effects. Notes:					
3. Are code enforcement efforts disproportionately affecting priority populations? - Is code enforcement resulting in demolitions that could be avoided by increasing a community's access to resources that support rehabilitation and refurbishment? - Is code enforcement of building violations enforced equitably and transparently? - Have steps been taken to address the root causes and needs of communities where code enforcement is concentrated? - How are landlords who do not maintain their properties held accountable, and how are their tenants supported? Notes:					

Figure 1 Example workbook page showing question sets for Maintenance, Preservation, and Refurbishment (MRP) strategies.

The development of this framework raised broader questions about the role of researchers in producing justice-oriented planning tools. Rather than positioning expertise as separate from practice, the workbook and practice stories emphasise co-production, long-term partnerships, and iterative feedback. The guides are not final, abstract products but living resources, designed to be adapted in local contexts.

Phase I Guide and Workbook: Circularity and Waste

The first guide and workbook: *Embodying Justice in the Built Environment: Circularity in Practice*, is structured around three critical phases in the building lifecycle: alternatives to demolition or the end life of built environment, resource management or the redistribution of materials from the end-of-life of buildings whether that is through distribution of reusable materials or status quo practices of landfilling these materials as waste; to

new construction (See figure 2.) (Minner et al., 2024, p. iv). Each phase presents an opportunity to repair harm and reimagine how materials, labour, and place are valued. The workbook offers justice-oriented questions intended to support practitioners in identifying interventions that can shift extractive, exclusionary systems toward more equitable and circular practices. While each city context is distinct, these strategies encourage planning professionals to examine embodied carbon and structural injustice in tandem.

	J1	J2	J3	J4	J5
1. How are priority populations identified and their needs and values included in MPR strategies? - Consider community-led mapping of areas negatively impacted by concentrated demolition activity. - Conduct a neighborhood audit of building conditions, ownership patterns, and other indicators to understand potential root causes of injustices related to MPR needs in the built environment. Notes:					
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Figure 2 Three strategies addressing waste and circularity in the built environment. (Credit: Circular Construction Lab)

1. Alternatives to Demolition

Developing alternatives to demolition requires attention to past injustices while incorporating just practices along a spectrum of building reuse. As the guide notes, "Places where building demolition activities have been concentrated are often sites of injustice" (Minner et al., 2024, p. 10). Demolition can signify both historical neglect and speculative redevelopment that threatens community stability. The workbook encourages planners to con-

sider building maintenance, preservation, refurbishment, and adaptive reuse as justice-oriented alternatives that reduce waste and dislocation. Justice prompts ask:

Is this code enforcement resulting in demolitions that could be avoided by increasing a community's access to resources that support rehabilitation and refurbishment (Minner et al., 2024, p. 12)?

How can salvaging opportunities benefit communities that have lost a valued building or site? Are there practices that can extend the life of materials and thereby extend their cultural presence (Minner et al., 2024, p. 22)?

The guide includes a practice story about the City of Portland's Empowered Neighborhoods Program, which assists BIPOC community members and persons with disabilities who have been notified by the City of code violations on their residential or commercial properties. Residents submit a simple online form and receive a response within two days. A municipal staff member works directly with them, connecting them to a network of community organisations that can provide architectural drawings, construction services, and access to free or low-cost reclaimed building materials for necessary repairs. Assistance is available in multiple languages.

2. Resource Management

The just distribution and reuse of building materials demands transparency, safety, and equity. Resource management strategies that support deconstruction, salvage, and material redistribution are evaluated in the guide using justice domains that attend to labour protections, environmental burden, and economic access. As stated in the workbook, "Unjust displacement and disruption through manufacturing facilities, brownfield growth, and off-gassing of materials within the supply chain perpetuate injustice globally" (Minner et al., 2024, p. 3). Interventions in this domain must address the invisible harm caused by linear material flows.

The guide includes a practice story about Re:Purpose Savannah, a women-led nonprofit, that advances deconstruction and material reuse by salvaging and labeling building components with their histories. Each site is carefully researched and documented, forming part of an online archive—Re:Purpose Neighborhoods—that preserves place-based stories through maps, oral histories, and photographs, while inviting public contributions to collective memory (Minner et al., 2024).

3. New Construction

Justice and equity in new construction involve changes to permitting, procurement, and design development that acknowledge past injustices and actively build inclusive futures. The guide calls for attention to "design stages, material sourcing, construction process, labor and workforce hiring and training, and building disassembly— must be reimagined as an apparatus for centering justice and equity." and for practices that ensure community voices shape what is built and how (Minner et al., 2024, p. 39). Policies that centre justice in construction contracts, material specifications, and workforce development are essential.

The BLOCK Project, run by Facing Homelessness, builds backyard homes for unhoused residents as sustainable ADUs. The homes are designed for disassembly, use Red List-free materials, minimise construction waste, and meet Living Building Challenge standards—reducing both carbon emissions and environmental harm across the building lifecycle. Residents help shape each design through an iterative, community-informed process. (Minner et al., 2024).

These strategies go beyond standing alone; they are interlinked responses to interlocking crises. Circularity becomes a justice practice when embedded in the lived realities of land, labour, and livelihood. The Embodying Justice framework asks planners to use every stage of the building lifecycle as a site of accountability and transformation.

Phase II: Just and Equitable Land Use Transitions

The Just and Equitable Land Use Transitions guide was developed to address a critical gap in climate planning:

how land use systems and regulations influence access, exclusion, and the ability of communities to remain in place. Where the circularity guide focused on building lifecycles and circularity, this phase focused on the governance and spatial planning that regulates what can be built, where, and by whom. Planning tools, such as zoning codes, overlay districts, and housing incentives, are often viewed as neutral policy mechanisms within the US. However, they represented contemporary mechanisms of land use control that are layered atop histories of injustice associated with settler colonialism, racial covenants, redlining, and exclusionary development practices. Land use is not neutral. Histories of dispossession, redlining, and exclusion shape it. These legacies continue to shape who can access and participate in land, services, and environmental quality, as well as who remains vulnerable to disinvestment or displacement. Some jurisdictions are under the impression that historical unjust practices remain in the past. This is not the case, as this history is deeply embedded in present patterns of land use and urban development. By considering new justice orientations, cities have an opportunity to develop land use that repairs and heals generations now and to come, fostering a more resilient and equitable urban environment.

The guide structures its justice questions through seven domains (J1-J7), asking planners, municipalities, and community members to reflect on how proposed land use changes intersect with historical harm, labor, and housing precarity, economic access, community involvement, and cultural continuity. For example, zoning reforms may increase density or green infrastructure but may also exacerbate gentrification or obscure Indigenous land claims if not carefully designed with justice in mind.

For example, Detroit's Community Benefits Ordinance (CBO) was the first city-wide policy of its kind in the United States, requiring developers of major projects to engage with residents and negotiate tangible community benefits. The ordinance arose from grassroots efforts by the Equitable Detroit Coalition and was formalised through a legally binding process. It has since secured a range of outcomes, including affordable housing, green space, job training, and sustainability investments. The Michigan Central Station redevelopment project included \$5 million for workforce education, \$2.5 million for affordable housing, and green infrastructure standards as part of its Community Benefits Agreement (CBO) process (Poe et al., 2025). Detroit's approach demonstrates how land use policy can embed justice, climate goals, and community leadership at the core of urban development.

This example illustrates a broader shift in land use planning: from top-down decisions to collaborative governance, accountability, and co-created futures. It also shows how climate mitigation can be woven into justice-based frameworks, such as through adaptive reuse, embodied carbon reduction, and urban greening. The Detroit CBO also demonstrates how communities can leverage legal mechanisms to institutionalise participatory planning and ensure long-term monitoring and enforcement, a key aspect of just implementation. In parallel, the guide highlights the importance of Indigenous sovereignty in land transitions. It outlines strategies to support land rematriation, honor treaties, and integrate Indigenous ecological knowledge into planning processes (Poe et al., 2025). Moving beyond recognition, this approach affirms co-governance, resource-sharing, and repair.

Justice-oriented land use planning requires moving past abstract equity checklists toward relational, place-based strategies. It requires centring those most impacted by planning decisions, acknowledging historical legacies, and designing tools that empower rather than dilute complexities and generational experiences. The Embodying Justice framework provides a methodology to ground this work in history, partnership, and the potential for land use as a form of repair.

Reflections for Scholars and Practitioners

The Embodying Justice framework provides planners, scholars, and policymakers with a set of flexible tools for engaging with justice in their work toward lowering embodied carbon and climate action. These tools were created to be conceptual, practical, situated, and adaptable to a wide range of settings. For planning, architecture, and other allied researchers, the framework's emphasis on reflection, co-creation, and critical engagement could make it a research tool in the assessment of local government programs and community engagement of carbon neutrality. In classroom settings, the justice questions and workbook prompts can structure assignments, case

study evaluations, or design workshops and studios focused on the intersection of climate action and justice. As a pedagogical contribution, the framework supports justice-based planning education by explicitly naming histories of harm, centring community expertise, and fostering relational accountability. It offers an alternative to technical rationality by insisting that planning is not value-neutral and that students must grapple with questions of power, legacy, and repair.

In practice, the framework supports policy and project teams in assessing proposals through multiple justice lenses. The “J” domains create entry points for dialogue across departments, allowing planners, architects, landscape architects, sustainability offices, procurement staff, and community engagement specialists alike to identify where justice is being advanced or bypassed. Their non-prescriptive nature allows for local calibration while supporting both highly-focused and expansive definitions of equity and justice. While the framework is intentionally flexible, local adaptation is critical. Each city has unique histories, governance constraints, and community dynamics. One risk of this set of workbooks is the misapplication of justice language as a checkbox or branding exercise. Without adequate capacity, institutional support, and community trust, even the well-intentioned process could either ignore or reinforce harms. Planning educators and researchers play a key role in cultivating critical reflexivity.

Across both guides, the emphasis on process, not just outcome, provides a durable foundation for teaching and practice alike. The call to “make notes, draw lines, and connect ideas” invites ongoing co-learning, interdependence, and situated action (Poe et al., 2025, p. 6). The guide does not offer universal metrics, but rather reminds us that justice must be continually enacted through embedded, relational work. As cities and institutions around the world pursue carbon neutrality, there is a growing demand for justice frameworks that are rigorous, actionable, and rooted in place. Embodying Justice contributes to the emerging body of work by naming harms, offering practical tools, and illuminating pathways toward transformation. It invites planners and scholars not only to ask what can be done, but to imagine who it must be done with, and for.

In discussions with the Carbon Neutral Cities Alliance, one issue that emerged in conversations was the challenge of working with European cities and the need to avoid imposing North American concepts of justice onto the European context without deeper reflection. Our conversations with the CNCA and European research teams revealed perceptions that community organising to address justice and equity do not work in the same ways as in Canada and the US. Thus, more work is necessary to understand how a framework derived from an articulation of principles and discussion of histories and practices specific to a North American context translates across the Atlantic. In future phases, more insights will be gleaned from further conversations with research contacts in Europe. Additionally, more information will be gathered from the application of the Embodying Justice resources in a North American context, their reception, and impact.

Conclusion

Justice is not a supplement to climate action; it is the foundation upon which meaningful transitions must be built. As this research has shown, the impacts of land use and building material lifecycles are inextricably linked to the histories that shape them. Extractive planning, exclusionary zoning, and carbon-insensitive development are not merely technical failures, but the outcomes of unjust policies and unequal participation and power.

Embodying Justice invites practitioners and scholars to centre repair and relationship, not efficiency alone. This requires collaborating with communities, particularly those most affected by past and present planning decisions, to co-create alternatives rooted in care, memory, and justice. It means using climate goals not only to reduce emissions, but also to restructure who holds power, who benefits, and whose voices are heard and considered.

We argue that justice cannot simply be layered onto existing frameworks; it must shape them from the outset. The guides developed through this project offer a scaffold for doing just that—not by prescribing fixed solutions, but by opening up pathways for situated, collaborative, and accountable action.

Cities must reckon with the buildings and zones they have inherited, as well as with the futures they envision for themselves. To build carbon-neutral futures that are not only technically effective but also socially transformative, we must take seriously the entangled legacies of place, people, and power.

Justice is both a goal and a method. It demands reflection, imagination, and a shared vision for what lies ahead. This project extends an open invitation: to keep building tools and visions for the present and beyond—and to work toward a lower-carbon future steeped in deep and enduring justice.

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