



Delft University of Technology

## The urbanization of climate finance

### Understanding for urban action

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## INTRODUCTION



# The urbanization of climate finance: Understanding for urban action

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Understandings of climate finance are in flux today in politically urgent ways, posing timely questions for critical urban scholarship and practice. The term *climate finance* came prominently into use as a point of contention in United Nations Conference of Parties (COP) debates over the last decade. It was employed in calls upon wealthy countries to dedicate funding to support climate change responses in the Global South—recognizing that many countries who have contributed least to the climate crisis now stand to suffer most from its impacts. Climate finance is also a growing priority for multilateral and bilateral development funders. However, governmental and multilateral channels of climate finance have persistently failed to meet pledged and called-for commitments, let alone address the more significant climate financing gap facing communities worldwide, or the even higher tally suggested by more transformative understandings of climate/ecological debt and reparations. Growing critical scholarship suggests that a major outcome of—and underlying factor in—this political impasse has been an increase in the power of private financial institutions to set the terms of new climate-related investment, and to define narratives of (and capacity for) financing responses in their favor.

Recent critical interventions from political economy and ecology, financial geography, international and development studies, and related fields have explored emerging forms of climate finance and climate-related financialization across multiple scales and arenas of intervention. Much analysis has focused on international and national levels. Processes examined include, for example, the more thoroughgoing ideological capture of multilateral funders, or the role of governments in “de-risking” investments as a means to attract and bolster returns for private financial capital (Bracking, 2019; Bracking & Leffel, 2021; Gabor, 2020). These moves extend beyond the troubled legacy of favored neoliberal instruments like emissions cap-and-trade, though carbon markets have also added an important financial dimension (Bryant, 2019; Bryant & Webber, 2024; Callon, 2009; Felli, 2014; Knox-Hayes, 2009, 2013; MacKenzie, 2009).

Beyond development finance negotiations and the COP process, however, actually existing climate finance is developing in multiple directions today (see Bryant & Webber, 2024). One important driver has been the push toward more expansive management of climate-related risks within the global financial system. Such initiatives include high-profile efforts to build international regimes of climate-risk disclosure, including by central banks, as well as moves by entities like the International Monetary Fund’s Financial Stability Board to define and delimit the role of these governmental entities in what remain essentially privatized regimes (Bryant & Webber, 2024; Christophers, 2017, 2019; Knox-Hayes & Levy, 2011; Knuth, 2017; Langley & Morris, 2020; Morris & Collins, 2023). Private financial imperatives are also structuring imagined solutions to key adaptation challenges related to insurability under climate risks and “peak peril” catastrophic payouts (e.g., Booth, 2021; Collier et al., 2021; Grove, 2021; Jarzabkowski et al., 2023; Johnson, 2013, 2015, 2021; Keucheyan, 2018; Scherer, 2020; Taylor,

2020). Meanwhile, investors are finding lucrative opportunities in emerging decarbonization interventions like large-scale renewable energy and transportation projects (e.g., Baker, 2022; Bridge et al., 2020; Causevic & Selvakkumaran, 2018; Knuth, 2018, 2023b; Rice et al., 2020).

Despite important strides in research on climate finance, this literature tends to focus on top-down institutions and their limits. As such, there remains an urban-geographical absence from much of the analysis. This is both an empirical and conceptual gap, one that we suggest hinders our capacity to understand actually existing climate finance as it hits the ground in cities, as well as our ability to engage with it practically and imaginatively. This special issue of the *Journal of Urban Affairs* seeks to empirically and theoretically advance this important line of critical inquiry and alternative praxis. We do so through a focus on the crucial and varied roles of cities and urban actors in the making, implementation, and governance of climate finance, with particular attention paid to how cities have become testing grounds for managing fresh vulnerabilities created through financial(ized) pathways of climate change response.

In the remainder of this introductory essay, we first set the stage for the collection by surveying emerging research directions on climate finance in cities. Following that, we introduce and reflect on the contributions made by the five papers assembled here, again with the dual aims of advancing scholarly knowledge in a fast-growing area of research and drawing out practical takeaways for urban action. We do so by presenting five cross-cutting insights which we believe can contribute to more critical, reflective, and justice-minded analysis and intervention. First, the collected papers provoke questions about how private climate finance is actually landing in cities and what this might mean. Notably, is much private climate finance arriving via an expanding geography of individuated, ring-fenced *projects* rather than more holistic (and potentially democratic) urban financing mechanisms? Second, the papers raise questions about mainstream narratives of financial “maturation,” i.e., arguments that increasing market familiarity will inevitably make private capital for mitigation and adaptation affordable and accessible. Papers here suggest that this is far from self-evident, especially for climate investments that are not clearly profitable. Third, the collection underlines that climate change remains as much risk as opportunity for private and public financial actors invested in cities. Papers question how these actors’ self-protection strategies will affect urban communities, potentially increasing risks for the many. Fourth, relatedly, authors challenge mainstream narratives that portray some places as “inherently” risky. Such naturalizations oversimplify complex physical risk exposures while reproducing problematic logics of financial redlining. Fifth, finally, the collection argues that climate justice movements must take on finance more seriously as a point of organizing, with papers offering specific tactical reflections.

## Locating climate finance in the urban: Emerging research directions

Climate finance is being “urbanized” in important ways today—and, conversely, climate action in cities is being “financialized.” We contend that such developments mark an extension and interrelation of other important trends noted by scholars: the practical and imaginative emergence of cities as key sites of climate action and struggles for environmental justice alongside various trends in the financialization of real estate, urban infrastructure, and governance. The latter processes have been extensively covered in existing urban geographic literature (e.g., Aalbers, 2020; Christophers, 2011; Crump et al., 2008; French et al., 2011) and we will engage them more selectively here. The former feature a major call over the last decade to position cities as key drivers of the problem of climate change and at the frontlines of its increasing impacts—but also as necessary to resolving these challenges and bending them toward more just futures (e.g., Angelo & Wachsmuth, 2020; Bigger & Webber, 2021; Long & Rice, 2019; Rice et al., 2023).

Recent analyses that elevate the role of climate action in cities and by urban governments—of course, not always the same thing, given cities’ widely varying levels of political and fiscal autonomy worldwide—build on longer-standing urban climate initiatives, city-based governance experiments, and urban networks like C40 Cities. Such urban climate governance has been explored by a now-

extensive literature (e.g., Bulkeley & Betsill, 2013; Bulkeley & Castán Broto, 2013; Castán Broto & Westman, 2020; Hughes, 2017; Van der Heijden, 2019; Webber et al., 2021). Meanwhile, scholarship on urban climate justice is extending even larger literatures focusing on urban environmental justice (e.g., Anguelovski, 2013; Bullard, 1990; Cha et al., 2020; Cutter, 1995; Holifield, 2001; McCreary & Milligan, 2021; Pulido & De Lara, 2018; Purifoy, 2021; Purifoy & Seamster, 2021; Ranganathan & Balazs, 2015; Ranganathan & Bratman, 2021; Sze & London, 2008). The collection aims to bring these research traditions on urban climate action, justice, and financialization together, asking what it means for private finance to see cities and climate change in new, accumulative ways, with what consequences for a just climate response, and in turn, what alternative imaginaries of urban climate governance can be made possible or foreclosed.

Urban scholarship has begun to ask these kinds of analytical and practical questions, often from the position of urban political economy and critical planning traditions. For example, one significant track of emerging research asks what it means for private financial institutions and apparatuses to identify and attempt to manage the urban dimensions of climate-related financial risk using their own industry-established parameters and understandings of value. Investors, commercial (re)insurers, and lenders are increasingly aware of these risks; this strand of research has found that their management responses intersect with—and potentially amplify—cities' and urban communities' preexisting climate vulnerabilities and social divisions (Collier & Cox, 2021; García-Lamarca et al., 2022; Taylor & Aalbers, 2022). Scholars have thus argued that cities highly exposed to both real estate financialization and climate risks may face combined crises of real estate devaluation, un/under-insurability, and collapsed fiscal capacity (Shi et al., 2023; Taylor & Aalbers, 2022). This risk is particularly notable in geographic contexts where urban government operations are structurally reliant on property taxes and value capture tools (Shi & Varuzzo, 2020; Shi et al., 2023; Taylor, 2020).

Recent investigations show that a related form of climate-financial risk for cities and urban governance capacity is being channeled via credit rating agencies, in the form of municipal bond downgrades for cities that raters judge to be highly exposed to arriving climate impacts. Downgrades make bonds less accessible and affordable for urban governments in these places, even as they may require more resources to mitigate such climate risks (Chung, 2019; Cox, 2022; Shi, 2020). Scholars are questioning how real estate-finance actors—ranging from local developer-investors to overseas asset managers—use emergent risk management tools and strategies to shift their investment management approaches in relation to assets and places that they classify as high risk (Taylor & Aalbers, 2022; Taylor & Erasmus, 2022). This emerging line of scholarship suggests that urban political economy more broadly must account theoretically for the profound disruptions that climate change—and its management by financial institutions—pose for many cities, their property regimes, and their fiscal futures (Gaber, 2021; Parish, 2023).

At the same time, researchers are also exploring proposed financial solutions to such urban resourcing challenges under climate change, for both rising climate risks and decarbonization needs. Notably, recent scholarship has examined the rise of green bonds and related financial instruments in cities of the Global North and South (Bigger & Millington, 2020; Bigger & Webber, 2021; Herrera, 2024b; Hilbrandt & Grubbauer, 2020; Jones et al., 2020; Knuth, 2023a; Liu & Lai, 2021). Green bond markets encompass financing for both decarbonization and adaptation action in cities. Green bonds and related instruments might finance cities' construction of large-scale renewable energy facilities or mass transit infrastructures. They may also channel capital to public or private building, repair, or retrofitting schemes—for example, for building-level energy efficiency improvements, rooftop solar, heat pumps, or district heating systems (e.g., August et al., 2022; Cohen & Rosenman, 2020; Knuth, 2016, 2019). These instruments may adapt established urban financial strategies like land value capture (e.g., around urban densification and property price rises associated with and/or attributable to transit projects and other urban re/development interventions; see Weber, 2010). Green bond market-makers are also experimenting with novel revenues and value capture from monetized emissions and energy waste reduction, renewable energy sales, green premiums and asset differentiation in urban real estate markets, and more.

While investigating the urban financial risks discussed above, an important though still limited track of research is exploring financialized experiments to keep cities and urban property insurable and valuable in the face of these challenges. Proposed financial solutions noted here include the expansion of practices such as insurance-linked securitization (ILS), mentioned above as a proposed strategy to recapitalize insurers against peak perils, like a major hurricane. Such novel insurance-financial markets and opportunities to “defer devaluation” (Taylor, 2020) are acutely relevant in highly exposed cities and urban property markets like those in South Florida and California. Taylor frames such interventions as a “fix for the spatial fix” in such property regimes—especially as existing public options and “insurers of last resort” like the U.S. National Flood Insurance Program, California’s Fair Access to Insurance Requirements (FAIR) Plan, and Florida’s Citizens Property Insurance Company are threatened by their own rising climate-related costs and uncertainties (Brundridge, 2024; Elliott, 2019, 2021; Taylor & Weinkle, 2020). Researchers show how insurance-linked securities like catastrophe bonds have attracted speculative investment in global (re)insurance markets and urban financial centers like London, Zurich, and Singapore (Johnson, 2013, 2015; Taylor, 2020), and in so doing forge new forms of intra- and inter-urban climate-financial connection (Taylor, 2022).

Meanwhile, researchers are tracking emerging financing developments for physical risk mitigation in cities, including openings for more reparative and decommodified strategies that conjoin decarbonization and adaptation response in and beyond urban spaces; for example, alternate capital switching for re-municipalization, community energy, and urban social infrastructure (Webber et al., 2022). Relevant adaptation measures might include climate-proofing retrofits such as elevating buildings against flood risk (Elliott, 2021) or hardening them against wildfire or hurricane impacts. They also encompass the construction and modernization of larger-scale urban infrastructures, such as levees, seawalls, and desalination facilities, as well as broader water provisioning, stormwater management, and flood control systems. As a now-sizable scholarship has explored, decades-old privatization drives in contexts like the United Kingdom and parts of the United States have already made relevant infrastructures like water systems lucrative investment targets for financial owners. Existing financialization schemes have converted these and other infrastructures into machines for generating and stacking financial returns for investors, alongside other debt-fueled accumulation strategies that are increasingly responsible for producing or deepening urban inequalities (Ashton et al., 2012; Colven, 2017; Grafe & Hilbrandt, 2019; Grafe & Mieg, 2019; Loftus & March, 2019; Pryke & Allen, 2019; Furlong, 2021; Heck, 2021; Milligan et al., 2024; Phinney, 2023; Ponder, 2021; Ponder, 2023). As these large-scale urban projects are reframed in terms of climate adaptation challenges, cities are proposing more experimental interventions like green infrastructures for ecological stormwater management (e.g., Reidman, 2021), and similarly experimental financing to support them (Christophers, 2018). More broadly, adaptation needs are drawing new capital to these infrastructures, in both northern and southern urban contexts (Bigger & Millington, 2020; Colven, 2017; Grafe, 2020; Grafe & Hilbrandt, 2019; Herrera, 2024a; Hofmann et al., 2024; Loftus & March, 2019; McElvain, 2023; Silver, 2023).

It is important to acknowledge and continue to call out dual forms of geographic unevenness here. What cities and urban spaces do financiers see as plausible landing sites for capital or places otherwise warranting attention (or not)? Not unrelatedly, what urban sites are receiving considerable attention from scholars, and which remain overlooked (and see Robin & Broto, 2021)? It seems clear that some forms of financial concern are being directed to already-financialized cities. For example, discussions of urban climate risks have frequently focused on high-value urban property markets and asset geographies where financial institutions hold significant value-at-risk of climate-related damage and devaluation. As a result, certain cities, and particular high-value areas and assets therein, are being selectively targeted for the most mainstream of climate finance interventions. This selectivity may already be creating new or deepened patterns of “splintering protectionism” (Johnson, 2015) and inequitable urban restructuring (Hadfield & Coenen, 2022; Taylor & Aalbers, 2022). As Diezmartínez and Short Gianotti (2024) observe in the U.S. context, decisions about what forms of urban climate action to fund are intimately lined up with municipal budgetary decision-making, and more concretely the

logics of debt finance (see also Shi, 2020; Shi & Varuzzo, 2020). Meanwhile, opaque and asymmetrical moves by credit rating agencies, catastrophe risk modeling vendors, and other institutional centers of financial power to reconfigure formulas and models of asset risk, depreciation, and devaluation will spark investment and underwriting shifts (Brundidge, 2024; Cox et al., 2023; Gray, 2021; Taylor & Erasmus, 2022; Taylor & Weinkle, 2020). These will have direct if variegated effects on cities, communities, and households already bound up in financialized urban property regimes (Knuth, 2020; Taylor & Aalbers, 2022), as well as producing knock-on effects for other markets through the transfer of risk and flow of investments (further discussed below). Beyond these uneven outcomes *within* favored urban geographies of intervention, such asymmetries also arguably contour networked discourses and imaginaries of urban climate financial intervention. Take, for example, how Miami has become a shorthand for urban climate risk problematization and response within (re)insurance networks (Collier & Cox, 2021), such that a risk finance investor in Singapore comes to frame challenges in Southeast Asia through the experience of South Florida (Taylor, 2022). Quite specific urban climate finance puzzles are becoming central touchstones in a repertoire of imagination and intervention, circulated and imported through networked institutional practices that shape prospects for urban climate action (Hilbrandt & Grafe, 2022).

Meanwhile, emerging scholarship raises concerns that drives to expand flows of climate finance to southern cities are still limited and selective, and risk maladaptive forms of financial inclusion (e.g., Bernards, 2021)—the last joining a longer legacy of exclusion and redlining by private lenders (Goldman, 2008). Such efforts represent an urbanization of key tracks of development finance, a trend which has accompanied the financialization described above. Researchers have explored moves such as the World Bank's recent drive to urbanize its climate adaptation lending, including new rounds of urban-level structural adjustment to transform southern cities into "creditworthy" recipients of this financing (Bigger & Webber, 2021; Grubbauer & Hilbrandt, 2023; Hilbrandt & Grafe, 2022, 2024; McElvain, 2023). At the same time, asymmetries in financial power risk new forms of disaster capitalism (Klein, 2015) in both the Global North and South, if cities are restructured for financialized extraction in the wake of climate disasters (Gotham & Greenberg, 2014; Gould & Lewis, 2021; Yarina, 2018).

Parallel to this, scholars emphasize that widespread financial invisibility remains despite recent drives for climate-related financial inclusion—particularly but again not exclusively in southern urban contexts. This can be seen, for example, within informal geographies that dominate urban experiences across much of the world, in which urban communities are developing practices of actually existing climate finance and provisioning outside formal structures of climate finance (Robin, 2022; Robin & Broto, 2021). Such tensions are also visible in appraisals of a growing array of initiatives which seek to assemble and stabilize opportunities for climate finance to fund urban interventions in the majority world, yet which also struggle to find purchase and scale, or which stand to reproduce incumbent urban inequalities (Forino et al., 2023; Hilbrandt & Grafe, 2024; Hofmann, 2022; Hofmann et al., 2024). Different but related forms of invisibility, such as the specters of longer histories of imperialism, coloniality, and debt crises, are also increasingly brought into the spotlight by critical scholars of climate finance (Hilbrandt & Grafe, 2022; Jacobs, 2019; Perry, 2021; Zodgekar et al., 2023). These invisibilities can also be seen in the selective absence or constrained capacity of particular actors and institutions to access financing resources for climate response, even within wealthier countries and metropolitan areas. Here, we might look at the case of renters in contexts like the United States, largely excluded from homeowners' insurance markets, or even cities with less property tax capacity, and therefore less leverage to fund privately financed decarbonization or adaptation. These ongoing exclusions also need more explanation, theorization, and rethinking as they unfold within differentiated urban geographies of climate-financial precarity.



## Introducing the collection: Five cross-cutting insights

In the context of this growing body of work, one main aim of this collection is to improve and consolidate understandings across these differentiated fields and research tracks, helping researchers locate site- and topic-specific interventions within a shared agenda and set of justice commitments. First, the collection gives us further insight into what the urbanization of climate finance is actually beginning to look like on the ground and how some of the research tracks and concerns noted above are brought into relation in urban spaces. The five papers assembled in this collection cannot, by any means, stand as a definitive view in that sense; with a relatively narrow range of geographic contexts covered, this work must be suggestive. However, the collection invites others to continue to take up these investigations in diverse urban situations and advances findings that we hope will prove mutually useful in further research.

Another central aim for the collection is to support praxis toward more just ways of resourcing urban climate action. The papers assembled here individually and collectively speak to a shared question: how can climate finance—or, rather, needed resources for climate action, in multiple forms—be (re)shaped and (re)imagined for the good of broader urban publics? As Cox (2024) emphasizes in her contribution here, simply taking urban climate finance for granted as an essentially technocratic and “post-political” undertaking is to cede crucial territory in shaping how, where, and upon whom resources for climate change mitigation and adaptation action are spent—and who gets to decide all of the above. With these two aims adopted as a point of departure, the remainder of this introductory essay draws out five insights from the collection, each of which connect to broader scholarly and practice-oriented debates about funding climate response in cities.

### *Tracking actually existing geographies of urban climate finance*

First, the collection raises important questions about how climate finance is landing in cities. Depending on the context, resources for urban climate action might practically arrive in many forms and scalings, from grants and debt through development finance institutions to resource-sharing from national governments (who may themselves take on new sovereign debt for the purpose), to insurance-based risk finance instruments and public-private partnerships, and more. These forms impose different conditions on urban governments and communities, and offer different openings for democratic shaping. As such, researchers must scrutinize emerging trends in the form and flow of private finance, questioning the kinds of political possibilities they embody and preclude for urban publics.

For example, forms and levels of U.S. federal resource-sharing for key urban infrastructures, in the form of public schools, are a central concern for Backer and Drake Rodriguez’s (2024) contribution to the collection; both the harms of past withdrawals of federal funds and the possibility and politics of claiming returned resourcing in grant- versus debt-based strategies. Similarly, the central object of Cox’s (2024) Miami-based paper in this volume is the use of general obligation bonds to finance climate action. This traditional instrument of U.S. urban debt still makes up a sizable share of the country’s multi-trillion-dollar municipal bond market. Cox highlights a crucial political quality of this financing form. Backed by property taxes and ultimately the “full faith and credit” of an issuing urban government, general obligation bonds give governments significant control over how public monies will be spent—assuming, of course, that bond measures can first win sufficient public support, as they generally require a public vote. As we will discuss below, for Cox this becomes a key moment at which organizers can drive debt-funded climate action toward more just urban interventions.

However, it is likewise critical to emphasize that not all U.S. municipal debt requires this public accountability. To avoid a public vote and the obligation to share proceeds from revenue-generating urban infrastructures with an urban government’s general fund, public and private actors have evolved alternate financing forms, such as the revenue bond, other boutique municipal bond forms, and varying public-private partnerships (e.g., Ashton et al., 2012; Sbragia, 1996; Weber, 2010). These



frequently complex and opaque arrangements share common logics in that they work to institutionally “ring-fence” profitable urban projects against risks, redistributive obligations, and public shaping or opposition. Crucially, all of these project-based finance structures and operating authorities typically operate more like private businesses than more democratically accountable fiscal instruments, even when they are run by public actors. In important recent cases (e.g., Ashton et al., 2012; Loftus & March, 2019), these structures have proven exploitable by financial owners in ways that maximize shareholder profits at the expense of the public good. Knuth (2023a) suggests that this array of privatized urban financing tools has made the United States an important exporter of models, heightened by calls to close the climate financing gap for cities worldwide.

It is significant, therefore, that in this volume Grafe et al. (2024) characterize such project-based finance as a major emerging trend in cities of the Global South. The authors explore how climate finance in the majority world is blurring with preexisting development finance, as seen in an emerging financial ecology of global climate finance initiatives (GCFIs), including multilateral development banks, their financial partners, and urban actors assembled in readiness for hoped-for investment. Grafe et al. argue that GCFIs are playing a key role in shifting traditional development aid to elevate private financial actors and logics in urban climate action. They suggest that projects and project-based financing centrally figure in these initiatives as a de-risking strategy that seeks to make previously excluded urban spaces “investable” for private climate finance. Leveraging the privatized qualities described above, the idea is that project-based financing creates risks and returns that are contractually ring-fenced, knowable, and controllable for investors—crucially, in ways that broader urban spaces and publics may not be. The kind of transnational project geography favored by GCFIs embodies different politics than nation-state-centered debt and resource-sharing, or more holistic and (in theory) democratically accountable urban instruments like general obligation bonds.

Project-based financing is hardly limited to development finance channels. Governments may voluntarily favor project-based deals for large mitigation and adaptation infrastructures—for example the kind of adaptation-relevant water infrastructures discussed by Loftus and March (2019). Project finance is already the favored instrument for many large-scale renewable projects. This choice of tools reinforces investor biases toward large utility-scale wind and solar farms over community-scale renewables, as the former pencil out better amid the traditionally high costs of arranging project finance deals (e.g., Baker, 2022; Christophers, 2024; Knuth, 2023b). In this volume, Taylor and Knuth (2024) explore further legacies of privatized urban finance in the United States, in special districts, “dirt bonds,” and other tools historically used to finance local infrastructural improvements. Today, many U.S. urban governments and entrepreneurs are adapting these instruments for climate financing tools like residential Property Assessed Clean Energy (PACE) lending, in voluntaristic decarbonization and climate-proofing schemes for homeowners. Taylor and Knuth’s account suggests that PACE embodies many similar propositions as large-scale project finance—i.e., that climate action directed toward individuated property/infrastructural interventions can generate value, that dedicated instruments can capture that value and use it to repay upfront debt, and that governments should dedicate resources toward supporting property owners making these non-redistributive investments.

### ***Questioning financial temporalities and teleologies***

Second, the collection raises questions about narratives of financial market “maturation” for decarbonization and adaptation. Mainstream arguments frequently suggest that as private markets become increasingly familiar with mitigation and adaptation investments, private capital for these purposes will inevitably become broadly affordable and accessible. These narratives are performing tangible work in justifying privatized urban climate finance and governmental de-risking—yet in practice such assumptions are far from guaranteed.

Grafe et al. (2024) argue that such narratives of financial maturation have been crucial in furthering GCFIs’ drive to expand private climate-development finance in cities of the Global South. Their pipelines of projects require anticipatory market-making, an expectation of growing markets, rising

liquidity, decreasing risks, and falling costs of capital. Grafe et al. show how these expectations are used alongside project logics as a wedge to bring historically excluded cities into mainstream financial spaces—and, perhaps more meaningfully, reshape cities' governance processes so that they pre-orient themselves in anticipation of *potential* private finance (Bigger & Webber, 2021; Silver, 2023, characterize these urban reorganizations as “green structural adjustment”). These interventions are creating project pipelines ready for anticipated private financial investment. Grafe et al. suggest that GCFIs occupy a narrow band of action. The implication is that wealthier cities or more lucrative projects will already be engaging in these kinds of project financing arrangements with private financial actors, and that too poor or otherwise uncongenial cities and projects will not be attractive to private finance in any case; GCFIs aim to spend their resources on cities and projects that might *become* investable with appropriate guided preparation and de-risking. As Grafe et al. point out, this geography does not match actual patterns of climate need, and urban governments may well reorganize urban institutions and spaces in readiness for investment that will never arrive. GCFIs have also used these future expectations to justify still-slow results in attracting private capital. However, if efforts continue to underperform, these expectations will be unsustainable.

On the one hand, mainstream climate finance does have success stories to point to here. Notably, renewable energy technologies like utility-scale onshore wind, solar photovoltaic, and more recently, offshore wind *have* seen trajectories of technological-cum-financial maturation, with private finance becoming more accessible and cheaper as mass production has lowered component costs and investors have become more familiar with developing these projects (Baker, 2022; Knuth, 2023b). Nonetheless, even these successes remain more dependent upon government subsidies and de-risking than some private accounts portray, and private finance remains much more expensive—and sometimes unavailable—for less profitable projects (Christophers, 2022, 2024; Knuth, 2023b). This is a crucial lacuna for renewable energy investments like community-scale energy and energy efficiency retrofits given that, as Backer and Drake Rodriguez's (2024) paper emphasizes, such projects have important capacities to address multiple kinds of decarbonization and adaptation needs at once, while advancing other key social purposes like improved environmental justice (see also related interventions such as Webber et al., 2022.). For example, if organizers can successfully push through calls upon federal resources, the energy-saving retrofits that Backer and Drake Rodriguez discuss for Philadelphia school buildings are likely to simultaneously lower school districts' emissions, save them money, improve students' health and educational outcomes, and make reparation for long-standing environmental injustice in the form of racialized physical-educational disinvestment in communities. One of the major failings of current resourcing structures is that these kinds of projects are very hard sells to private capital interests.

On the other hand, historically wealthier cities may already be becoming *less* investable—because of rising climate stresses, but also preexisting financial strains. Growing climate risks might mean that cities and urban actors that have had freer access to private financial markets might see more constraints and be forced into a geography of projects where private finance has more control. One key reaction of arms-length financiers in urban markets affected—for example, a European pension fund manager invested in South Florida real estate—has been to retreat to a defensive view of project-based risks, whereby new deals are called off, or individual assets are either hardened through retrofits or prioritized for write-down and sell-off (Taylor & Erasmus, 2022). As many scholars have noted, there is an urban geography to these changing financial logics, contoured around physical climate risk but also preexisting terrains of “valuable” urban space deemed worthy of protection. Here, enduring historical legacies shape ongoing “outsides” of climate action and resourcing. For example, a similar rise of project geographies as a mode of retrenchment amid a perceived increase in investment risks, notably occurring in U.S. cities facing Rust Belt declines and federal funding cuts under neoliberalism (see Backer & Drake Rodriguez, 2024; Cox, 2024). As both contributions argue, such patterns were and are also shaped by underlying race-class inequalities, and how those continue to take shape in U.S. urban fiscal geographies. Notably, Black-majority cities that cannot be denied finance altogether due to government requirements are still being funded more grudgingly, on poorer terms for the

public versus private actors and with less control over resources and projects (see Ponder, 2021; Ponder & Omstedt, 2022).

In a more basic sense, many adaptation interventions pose profound uncertainties as profit-generating prospects, now and in future. *Can* these risk mitigation interventions “mature” in ways that generate attractive profits? Can they do so without abetting new financial violences and increased risks to diverse urban publics? It remains questionable, for example, whether experiments with land value capture to directly finance large-scale urban adaptation projects like seawalls (e.g., Colven, 2017) can be realized in practice. Can avoided losses and damages provided by these infrastructures actually be monetized and secured in traditional value capture models? Taylor and Knuth’s (2024) contribution illustrates some of these market-making difficulties, in exploring U.S. efforts to expand PACE financing as a technique for financing hurricane hardening in Florida. Earlier PACE applications allowed homeowners to recoup upfront retrofitting costs and repay liens through energy cost savings (though not always successfully even then). Advocates in Florida—local governments and their private lending partners and subcontractors—argue that households can similarly repay PACE loans via savings in insurance premiums, and more nebulously via potential protection against climate-related property devaluation. These expected savings have been difficult to realize in practice, especially as relevant insurers may be exiting the state full stop; in the meantime, predatory PACE lending practices have raised significant consumer protection concerns. Where do such mixed financial experiments leave households who are stuck with very real repayment obligations in the present?

### ***Understanding financial institutions’ risks and risk displacements***

Third, the collection emphasizes that climate change remains as much a risk as an opportunity for financial institutions, and that these actors’ self-protective moves pose risks for urban communities. As discussed above, drives to identify and disclose climate-related financial risks have gained ground with central banks and other actors at the commanding heights of the global financial system, and (re)-insurers face widely publicized dilemmas as both damages and consumer premiums mount. Papers assembled here argue that these risks to public and private financial actors matter as much for urban climate finance as the speculative financial expansions above. As financial institutions develop a clearer understanding of financial value-at-risk, their responses demand scrutiny: how will these risk management moves affect cities and urban communities and shape risks experienced by broader publics?

Critical research and praxis must be wary of taking financial depictions of “risky” cities at face value, as we argue below. However, we also cannot ignore how these understandings are being put to work in practice. Notably, such considerations matter in how broader government- and finance sector—led drives to track and disclose climate-related risks hit the ground in cities and communities. A central motivation for these pushes has been fears that climate risks might drive too-rapid and uncontrolled devaluation of diverse assets from fossil carbon reserves to urban real estate—enough to threaten the stability of the financial system itself. Christophers (2017) and Taylor and Aalbers (2022) argue that these efforts are once again uneven. Initiatives focus on urban geographies that “matter” to the global financial system, overlooking poorer cities and communities while concentrating on places where high real estate valuations and high exposures to climate impacts coincide. As Knuth et al. (2024) contribution to this volume demonstrates, the United States has become a particular locus for these concerns, as geographies of financial value and value-at-risk coincide in places like Florida and California cities; these perceived threats also shape the calls for adaptive investment Cox’s paper discusses in Miami and Taylor and Knuth similarly track around PACE lending in Florida. As Knuth et al. discuss, U.S. housing markets are particularly exposed to climate risk in ways that might damage the financial system because of legacies of federal government support for mass homeownership. These existing investments mean that not only frontline homeowners but major federal government institutions like Fannie Mae are exposed to risks, including more frequent and intense weather

disasters, increasingly unavailable and costly insurance, and the prospect that these combined risks will rapidly devalue urban property at scale.

Knuth et al. (2024) raise the possibilities of new forms of “climate redlining” as a crucial concern here. When facing these risks and the compulsion to make them more explicit through federal mandates for climate-related financial risk disclosure, one potential outcome is for Fannie Mae and mortgage lenders to divest their portfolios in highly exposed cities and neighborhoods and cease new lending in these areas. Lenders and their government off-takers may also be turning to more exotic financial engineering to de-risk existing loans in ways that ultimately increase direct consumer costs and risks. Many private mortgage lenders may ultimately retreat if they lose a key means of government support and recapitalization—something banks may already be consciously relying upon as they write loans in risky areas (Keenan & Bradt, 2020). What then is left for urban communities and governments without this same freedom to exit? Will further speculative financial opportunities be created for richer households or investor-owners less dependent on federal apparatuses to buy homes and more able to bear rising costs of insurance or damages—i.e., further expansions in terrains and mechanisms of splintering protectionism and climate gentrification? Will the scale of risk-related contraction, redlining, and disinvestment outweigh even their capacities? All of these questions will in turn be shaped by preexisting inequalities in cities’ and communities’ resources, including uneven entanglements with municipal bond, mortgage, and (re)insurance markets.

### ***Challenging naturalized narratives of climate risk***

Fourth, contributors argue that responding to climate-financial risks requires denaturalizing and challenging certain risk narratives, and addressing their embedded social assumptions. It is crucial to understand how the contours of physical climate risks intersect with frontline urban geographies, where there are often highly complex relationships between risk exposure, vulnerability, and preexisting forms of environmental injustice. A clear danger in mainstream investor narratives is that some places and communities become understood as “naturally” or “inherently” more risky than others in laying out programs of new or maintained resourcing of cities and urban lifeways. These forms of “anticipatory ruin” (Paprocki, 2019) may prematurely foreclose viable climate risk responses and urban futures in such places. In the first instance, the similarity of these narratives to historical justifications for redlining should give us pause—speaking, as several contributions in this collection do, to the U.S. housing debt context that spawned the term, but also effectively to the logics that have kept most cities of the Global South from accessing finance on anything like equal terms.

This caution on risk narratives is not to deny that climate change impacts do vary in where and how significantly they will emerge—these material dimensions profoundly matter. Rather, it is to underline how much the second nature of urban environments themselves also become practically significant in shaping real urban sensitivities to these risks. These more complex factors may be missed in more rapid assessments of climate risks; for example, a too-simplistic look at cities’ elevations or a “quick scan” of a proprietary risk score (e.g., Cox et al., 2023; Jacobs, 2019). Relevant physical factors and risk responses can include building codes, climate-proofing retrofits, large-scale infrastructures like seawalls or programmatic interventions like wildfire load reduction, nature-based solutions, and many more—to say nothing of a broader array of social and programmatic interventions that can address risks. All can meaningfully reduce urban climate risks, to property and property-based financial assets as well as to human and more-than-human life possibilities. Crucially, such strategies for understanding and responding to climate risks—including even the most essential existing physical infrastructures—are often missing from the black-boxed, arms-length urban risk assessment tools used by financial market actors. Put differently, the messy realities and possibilities of urban climate risks and responses have not been, and perhaps can never be, adequately captured by the gaze of finance.

In understanding these more complex urban risk geographies, what they mean for climate-related financial risks, and for whom, much depends on how public resources have been spent and will be spent in the future. As several contributions in this issue explore (Backer & Drake Rodriguez, 2024;

Cox, 2024; Taylor & Knuth, 2024), even wealthy countries like the United States have problematic records of urban resourcing expenditures in poorer and nonwhite cities and communities. This legacy of racial capitalism makes for both uneven social vulnerabilities and material sensitivities to climate risks, which can inform a justice-minded set of questions of risks and response needs in cities: Are the most at-risk individual properties built to recent codes, or can they be retrofitted to new codes? Are they in areas protected by larger legacy infrastructures like levees, pumps, and seawalls? What is the state of repair of these structures, if so? Are buildings near toxic sites that are exposed to rising seas or stronger storms? Are they in the protective path of new infrastructures, or will this spending be directed toward wealthy cities or neighborhoods where high underlying property values are used to justify major public expenditures? What about “critical infrastructures” of various types and at various scales, including public buildings like schools (Backer & Drake Rodriguez, 2024)? What about infrastructure like affordable and public housing that responds to second-order climate risks like climate gentrification—for example, as in Cox’s (2024) case in higher elevation, historically Black neighborhoods in Miami that are less immediately at risk from sea level rise?

### ***Taking a tactical view on urban climate finance***

Fifth, and finally, movements for climate-financial justice need an ongoing tactical focus on tools and possibilities. This final point picks up on one raised at the outset: it is vital not to relegate urban climate finance to private financial actors and other more technocratic players, particularly as invocations of the climate emergency create ongoing openings for this kind of climate post-politics. Behind every financial tool and financialized understanding discussed here and throughout this collection are real stakes in the allocation of crucial resources to address epoch-defining challenges—as well as real opportunities for turning this generational investment toward genuine collective benefit rather than a propping-up or worsening of an urban business-as-usual that already fails many.

Many contributions here dig into climate-financial tools themselves as a route toward opening up these conversations. As discussed above, Grafe et al. (2024) and Taylor and Knuth (2024) make similar observations about privatized urban financing tools being trialed across diverse urban geographies: individuated, ring-fenced, non-redistributive, and in Taylor and Knuth’s case voluntaristic, as homeowners can choose whether or not to invest in climate-proofing. However, Cox (2024) considers how urban financing tools can be leveraged in more progressive ways. She investigates the political possibilities of general obligation bonds via the case of a major and precedent-setting resilience bond recently approved in Miami; specifically, the real political openings created when climate-related public debt must be approved by broader publics. Through the Miami case, Cox shows how urban organizers rallied to make large-scale physical risk mitigation efforts serve a broader constituency, through the framing of climate gentrification and affordable housing crises as an equally pressing present threat to some communities and constituencies as direct physical risks.

On a broader scale, contributions from Cox (2024) and Backer and Drake Rodriguez (2024) particularly underline the importance of not setting ambitions too low in working to define more just climate resourcing interventions and pathways: achieving more just versions of climate finance cannot simply be about rolling back neoliberal legacies of financialization and, particularly, extractive versions of public-private partnerships and state de-risking. Although financial forms like general obligation bonds *can* be more democratic and redistributive, Cox underlines some of the many ways in which these measures have failed to be so in practice; yet again, historical racialized-classed equalities have meant that some cities and neighborhoods have struggled for successful recognition of their “worthiness” (Cox, speaking to the work of Destin Jenkins, 2021) for a necessary share of collective public resources.

Similarly, Backer and Drake Rodriguez (2024) raise both cautions and possibilities in working through the tactics of urban educational justice movements, as organizers seek to reverse trends of larger government withdrawal of funds for cities and crucial urban infrastructures like schools. It is not just the return of these funds that matters, or even an



expanded and broadened version of that redistributive funding via the central state—though both are crucial projects for progressive and radical organizing in visions like a Green New Deal (Rodriguez et al., 2021). It is also *how* those resources arrive, and in what forms, that matters. Backer and Drake Rodriguez chronicle broad divisions in the choice of financing instruments sought by organizers, particularly between fiscal forms via direct government investment and grants versus monetary policy tools to expand debt that schools can take out (see Bryant & Webber, 2024, for a similar discussion at the national level). Their intervention underlines that such choices have long-term stakes, as well as carrying more immediate tactical advantages and disadvantages in driving resourcing visions against political opposition. (Moments of tactical opportunity are also a concern for Cox, 2024, who speaks to the openings that climate change's unsettled forms and disaster politics may create for breaking through political impasses.)

Backer and Rodriguez (2024) leave us with the crucial point that *urban climate finance* is a term that probably cedes too much ground from the outset: debt and financing are only one way of funding climate response in cities, historically one with its own long-term regressive politics. Drawing on critical resource theory, the authors instead prefer a language of resources, speaking to, for example, “[t]he racialized theft of resources in school finance” (p. 3). MacKinnon and Derickson (2013) have similarly called for attention to the politics of language in climate change response. They advance an “interim politics of resourcefulness” as an alternative to often-fraught invocations for community “resilience”; as Derickson (2016, p. 165) expands, attention to “very basic and perhaps banal issues around resources, distribution and maldistribution that [make] it harder to make futures.” As movements for climate-financial justice across different urban geographies make common cause, another key ally will therefore be broader debt justice and reparations movements in and beyond the urban level, as well as beyond these authors’ U.S. context. Forging such imaginative and practical alliances will be crucial tasks for scholarship and praxis on urban climate finance moving forward—a program we welcome and hope to have advanced here.

## Disclosure statement

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