

Climate Finance for Cities and Urban Governments

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Introduction

In a rapidly urbanising world, cities are crucial to transformative action on climate change. Influential estimates suggest that cities now account for 78% of world energy consumption and more than 60% of carbon emissions, while 70% of the world's cities are already experiencing climate change impacts.^{1,2} The United Nations Sustainable Development Goal (SDG) 11, Sustainable Cities and Communities, cannot be met without explicitly recognizing the challenge of climate change.³ At the same time, ambitious actions taken to reduce urban emissions and increase resilience can enhance cities' quality of life and social equity in far-reaching ways.⁴ However, building just cities in an era of climate change will require well-considered investment at an unprecedented scale – a challenge far from resolved today.

The objective of this briefing is to characterise this urban climate investment challenge across multiple dimensions, survey financial pathways emerging today and consider future directions. There are many definitions of a city. 'City' can refer to an administrative unit or a certain population density.⁵ We use an operational definition of a city as a place with a relatively high concentration of population in space, following common practice across geographical, social, cultural and economic disciplines.⁶ Some financial strategies discussed here are administered by urban and municipal governments, from entities such as mayor's offices and local councils to public authorities, utilities and agencies, special districts and other context-specific sub/city-level governing units. Others are organised by international institutions, national and regional governments and private and non-governmental actors – but with meaningful implications for urban populations, by design or circumstance.

This discussion supports a number of COP26 goals, particular its key commitment to mobilise finance.⁷ We note exemplary contributions being made on these questions by scholars in the humanities and social sciences, as well as key issues that require more understanding and publicly engaged scholarship. We organise our observations into three overarching propositions.

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- 1 United Nations (n.d.). *Cities and pollution*, <https://www.un.org/en/climatechange/climate-solutions/cities-pollution>.
 - 2 C40 Cities (2012). *Why cities: Ending climate change begins in the city*, <https://www.c40.org/ending-climate-change-begins-in-the-city>, accessed 29 September 2021.
 - 3 United Nations (n.d.). *Goal 11: Make cities inclusive, safe, resilient and sustainable*, <https://www.un.org/sustainabledevelopment/cities/>, accessed 30 September 2021.
 - 4 A diverse scholarly literature now supports such arguments. See, for example, Fitzgerald, J. (2010). *Emerald cities: Urban sustainability and economic development*. Oxford University Press; Bulkeley, H. (2013). *Cities and climate change*. New York: Routledge; Aronoff, K., Battistoni, A., Cohen, D. A., & Riofrancos, T. (2019). *A planet to win: why we need a Green New Deal*. New York: Verso Books. Other expressions have seen both wide influence and significant scholarly critique; e.g., Glaeser, E. L., & Gottlieb, J. D. (2009). 'The wealth of cities: Agglomeration economies and spatial equilibrium in the United States', *Journal of Economic Literature*, 47(4), 983-1028; Peck, J. (2016). 'Economic rationality meets celebrity urbanology: exploring Edward Glaeser's city', *International Journal of Urban and Regional Research*, 40(1), 1-30.
 - 5 European Union (2011). *Cities of tomorrow – challenges, visions, ways forward*, https://ec.europa.eu/regional_policy/sources/docgener/studies/pdf/citiesoftomorrow/citiesoftomorrow_final.pdf, accessed 19 October 2021.
 - 6 For recent climate change-relevant reflections on these definitional questions, see McFarlane, C. (2016). 'The geographies of urban density: Topology, politics and the city', *Progress in Human Geography*, 40(5), 629-648; Knuth, S., Stehlin, J., & Millington, N. (2020). Rethinking climate futures through urban fabrics:(De) growth, densification, and the politics of scale', *Urban Geography*, 41(10), 1335-1343.
 - 7 UNFCCC (2021) *COP26 goals*, <https://ukcop26.org/cop26-goals/>, accessed 30 September 2021.

Proposition 1: Investment pathways are emerging but remain uneven.

Climate finance has been dominated by United Nations agreements and multilateral development finance channels, driven by justice imperatives around wealthy countries' outsized historical role in greenhouse gas emissions. They are increasingly joined by other governmental pathways for development finance, as well as private sector finance and novel financial instruments. Public and private finance are now targeting longstanding mitigation and adaptation dilemmas.

However, major inequalities persist in the ability of cities and urban communities to access investment needed, particularly in Least Developed Countries (LDCs), and a serious 'financing gap' remains.

Proposition 2: Cities' climate investment needs are differentiated.

Some urban challenges are now shared by many cities worldwide (for example, particulate and NOx pollution, unplanned sprawl, heat island effects and more). However, there is no 'one size fits all' solution to urban climate finance. Many mitigation and adaptation challenges vary by place and require distinct — though increasingly overlapping — investments. Strategic choices made in how and at what scale to target responses make for differentiated resourcing needs and pathways. Meanwhile, legacy inequalities between and within cities shape uneven capacities and climate vulnerabilities for urban populations — from histories of colonialism to discrimination along many lines (race, class, gender and more). These same legacies shape differential governmental resources and options available for response, administered at the urban level or beyond.

Proposition 3: Just climate investment requires transformative practice.

The *quantity* of investment needed is not the only crucial question facing cities: the form and terms of that investment matter for just outcomes. Who is included and excluded, what are the costs and risks of certain types of financial 'inclusion' and who ultimately bears them? What kinds of low-carbon future do loans and other instruments enable or foreclose? Making climate investment just and tackling its toughest challenges requires creative thinking and transformative responses to more systemic dimensions of climate vulnerability and risk — including underlying economic and financial inequalities.⁸ A range of emerging programs internationally suggest potential pathways.

8 Shi, L., & Moser, S. (2021). 'Transformative climate adaptation in the United States: Trends and prospects'. *Science*, 372(6549), 1-9.

Proposition 1: Investment pathways are emerging but remain uneven

Recent histories of climate finance

The term ‘climate finance’ has historically referred to a key source of funding for urban adaptation and mitigation efforts, channels through which industrialised nations are meant to provide resources for low-carbon and resilient economic growth in developing countries.⁹ This commitment responds to the underlying truth that developing nations of the world bear least responsibility for climate change, yet are worst equipped to deal with it.¹⁰ Much of this developmental and donor-driven finance is relevant for urban populations, recently with expanding channels for urban governments as well.

Multilateral channels have been a crucial arena for climate-related investment. Financial mechanisms and climate finance pledges established through the United Nations Framework Convention on Climate Change (UNFCCC) and Paris Agreement are important here. Exemplary funds include the Adaptation Fund (AF), the Green Climate Fund (GCF), the Special Climate Change Fund (SCCF) and the Least Developed Countries Fund (LDCF). In 2015, an inventory from the Organisation for Economic Co-operation and Development (OECD)¹¹ listed ninety-one active climate funds (the majority multilateral, followed by bilateral funds); most targeted multiple fields including cities. Newer OECD figures show that climate finance provided and mobilised by developed countries for developing countries totalled USD 79.6 billion in 2019, up 2% from 78.3 billion in 2018. With major investment needs still unmet, COP26 presents a chance for many multilateral climate finance pledges to be renewed, and old ones fulfilled.¹²

Multilateral climate finance is also taking more diverse channels today. For example, the World Bank’s multilateral Clean Technology Fund (CTP) has made the largest climate finance contributions in Latin America, approving USD 947 million in twenty-nine projects across Mexico, Chile, Colombia, Honduras and Nicaragua. The Green Climate Fund (GCF), which is the largest climate fund available today, has a country driven approach, but is increasingly expanding its paradigm to mobilise finance for cities. However, it is worth noting that not all of these experiments have been successful. For example, in 2018 the GCF approved USD 195 million for promoting energy efficiency in Brazilian cities, but this fund lapsed in 2020.¹³ Other important multilateral funds include the Asian Development Bank’s (ADB) Shandong Green Development Fund and the European Bank for Reconstruction and Development’s (EBRD) Green Cities Facility. These funds seek variously to leverage public finance, build business cases for climate investment and deliver bankable projects.

9 Climate finance refers to local, national or transnational financing — drawn from public, private and alternative sources of financing — that seeks to support mitigation and adaptation actions that will address climate change. See UNFCCC (2021). *Introduction to climate finance*, <https://unfccc.int/topics/climate-finance/the-big-picture/introduction-to-climate-finance>, accessed 16 September 2021.

10 Roberts, J. T., Weikmans, R., Robinson, S. A., Ciplet, D., Khan, M., & Falzon, D. (2021). ‘Rebooting a failed promise of climate finance’. *Nature Climate Change*, 11(3), 180-182.

11 OECD (2015) *Climate Fund Inventory: Report to the G20 Climate Finance Study Group*. Paris: OECD Publishing. Available at <https://www.oecd.org/g20/topics/energy-environment-green-growth/database-climate-fund-inventory.htm>.

12 OECD (2021). *Climate Finance Provided and Mobilised by Developed Countries: Aggregate Trends Updated with 2019 Data*. Climate Finance and the USD 100 Billion Goal. Paris: OECD Publishing.

13 Green Climate Fund (n.d.). *Latin American and the Caribbean* <https://www.greenclimate.fund/project/fp065#details>, accessed 19 September 2021.

Increasingly, these multilateral development funders are joined by bilateral pathways and Direct Foreign Investment (DFI), as well as regional and national climate funds and initiatives. Many of these funders are taking a growing interest in urban finance. For example, key bilateral donors on climate include the European Union through the Global Climate Change Alliance (GCCA) and the Scandinavian countries through their international development agencies. Meanwhile, foundations such as the Bloomberg Philanthropies and the Rockefeller Foundation offer financing worldwide, as do donors such as the German Federal Ministry with a focus on cities and climate.

Significant regionally focused initiatives include the Urban Climate Change Resilience Fund (UCCRTF) with a focus on Asian cities. Also in Asia, the Urban Environment Infrastructure Fund (UEIF) looks at pro-poor urban development. In Latin America and the Caribbean, the Inter-American Development Bank (IDB) and other international donors, mostly European countries, have set up the Sustainable Energy and Climate Change Fund. Meanwhile, the African Climate Change Fund (ACCF) has been joined by the African Development Bank (AfDB), which supports its regional member states through a set of climate finance funds and initiatives to deliver projects and programmes. Notably, with support from Nordic development agencies, the AfDB has established an Urban and Municipal Development Fund (UMDF) to strengthen the implementation of its Urban Development Strategy. The UMDF is intended as a project preparatory fund to support African cities in preparation of larger investments in climate-resilient urban infrastructure, including urban governmental initiatives and intended private sector participation in delivering urban services.¹⁴

Important new experiments seek to grow urban governments' and players' direct financial options, as well as channel climate financing resources to urban populations through more centrally organised schemes. However, some context for how cities relate to these development finance pathways is useful here. First, unlike rich-country urban governments that may have access to large municipal bond markets — US cities and the country's decentralised fiscal federalism are a stand-out example¹⁵ — city-level governments in developing countries have traditionally been unable to borrow directly in pursuit of urban programs. This lack of access is partially due to the fact that in and beyond developing contexts, countries with more centralised governmental structures tend to limit urban governments' independent powers and fiscal autonomy.

Over and above that structural issue, international banks and financial centres long considered urban government debt too risky, outside very established centres of 'safe' municipal bond lending like the United States.¹⁶ Indeed, as the 20th century history of the World Bank demonstrates, even national governments and sovereign debt in developing contexts historically struggled to secure private finance without the intermediation of multilateral development institutions; cities were seen as riskier still and typically excluded from these channels.¹⁷ More often than not, urban governments and/or populations in developing countries continue to access financing options only through intermediaries such as national governments

14 African Development Bank Group (2021). *Urban and Municipal Development Fund*, <https://www.afdb.org/en/topics-and-sectors/initiatives-partnerships/urban-and-municipal-development-fund>, accessed 23 October 2021; Nordic Development Fund (n.d.). *Urban & Municipal Development Fund for Africa* [NDF C100], <https://www.ndf.int/what-we-finance/projects/project-database/urban-municipal-development-fund-for-africa-ndf-c100.html>, accessed 19 September 2021.

15 Sbragia, A. M. (1996). *Debt Wish: Entrepreneurial Cities, US Federalism, and Economic Development*. Pittsburgh, PA: University of Pittsburgh Press.

16 Ibid.

17 Goldman, M. (2005) *Imperial Nature: The World Bank and Struggles for Social Justice in the Age of Globalization*. New Haven, CT: Yale University Press.

and international banking institutions, and organisations such as multilateral development banks and the United Nations are still unable to link up directly with urban communities.

Expanding players and instruments

Despite these obstacles, the pool of climate-related investment available to urban governments and/or populations is growing and changing rapidly, in part due to the entry of private sector financial players and novel financial instruments. Climate-related urban investment now spans government, corporation and commercial finance, as well as households and a substantial share of ‘unknown’ sources of private finance. In 2018, the International Finance Corporation (IFC) a part of the World Bank Group that focuses on financing for business in developing countries, argued that cities in fast-developing contexts have the potential to attract more than USD 29.4 trillion in cumulative climate-related investments by 2030.¹⁸

In service of this vision of ‘unlocking’ private investment for developing country cities, the IFC put forward various models and financial instruments that urban governments in developing countries might deploy for attracting financial partners, investors and lenders; for example, public-private partnerships (PPPs), ‘value capture’ mechanisms and green bonds. To discuss one channel, value capture tools have become increasingly influential as urban governments seek new ways to extend their fiscal capacity, often with private financial partners.¹⁹ Value capture finance includes instruments like revenue bonds, special assessment districts and tax-increment finance (TIF) bonds, all of which allow cities and financial partners to more directly recapture upfront investments in infrastructure or land acquisition. Frequently, instruments pay back dedicated debt in municipal bond markets via expected return from these public investments (e.g., fees, tolls and land value and property tax increases). Investment may involve new financial players and partners across a differentiated sector (e.g., banks, sovereign wealth funds and other large institutional investors like pension funds, private equity, corporations, ‘impact investors’ and beyond).

Meanwhile, a set of financial innovations seeks to secure climate-strained insurance and reinsurance regimes. These schemes are of major importance for urban real estate markets and housing tenures, particularly in high-climate risk sites and regions. New catastrophe bond markets and insurance-linked securitization (ILS) practices pledge to recapitalise insurance markets threatened by new ‘peak peril’ pay-outs and disperse these risks among global investors. They have been particularly active in high-property value, high-risk cities with widespread existing — but now strained — property insurance regimes, with the US state of Florida a particularly important site of experimentation.²⁰ New sovereign and multilateral strategies like the Caribbean Catastrophe Risk Insurance Facility (CCRIF) and World Bank sovereign catastrophe bonds pursue similar financial strategies, while new parametric insurance models and ‘weather derivatives’ are meant to ease calculative barriers and damage attribution problems in determining pay-outs (i.e. via paying out pre-contracted amounts in response to set triggers and thresholds, rather than full appraisal of damages actually experienced).²¹

18 International Finance Corporation (IFC) (2018). *Climate Investment Opportunities in Cities An IFC Analysis*. Washington, DC: IFC. Cumulative totals presented from date of publication to 2030.

19 For example, Ashton, P., Doussard, M., & Weber, R. (2012). ‘The financial engineering of infrastructure privatization: What are public assets worth to private investors?’ *Journal of the American Planning Association*, 78(3), 300-312.

20 For example, Johnson, L. (2015). ‘Catastrophic fixes: Cyclical devaluation and accumulation through climate change impacts’ *Environment and Planning A*, 47(12), 2503-2521; Taylor, Z. J. (2020). ‘The real estate risk fix: Residential insurance-linked securitization in the Florida metropolis’ *Environment and Planning A: Economy and Space*, 52(6), 1131-1149.

21 Grove, K. (2012). ‘Preempting the next disaster: Catastrophe insurance and the financialization of disaster management’ *Security Dialogue*, 43(2), 139-155.

Potential exists here in theory for virtuous cycles of investment, as mainstream urban planning and policy discourses now argue at length.²² The thinking in this framing is that cities can attract investments through PPPs, targeted taxes and incentives to encourage investment in green infrastructure — favouring density over urban sprawl or low-carbon energy over fossil-fuel sources. Enhancing density can increase the viability of connected public transport over private car use. Meanwhile, land value capture mechanisms can in theory encourage green infrastructure development to attract private investment, and instruments such as green bonds may enable private green investment more broadly.²³ For private investors, cities that are climate friendly are likely to become more attractive to high-skilled, high-wage workers, as well as advancing many ‘co-benefits’. Meanwhile, as new measures of emissions are put in place and new technologies and interventions are mainstreamed, these projects may make better ‘business sense’.

One significant example is the 2017 issue of the first sub-sovereign green bond. In this issuance, the city of Cape Town launched a green bond valued at 1 billion South African Rand (ZAR) (USD 76 million),²⁴ (other cities like Tokyo and Paris have since issued their own). Cape Town used a qualified intermediary to market the bond and register it with the Johannesburg Stock Exchange. The reaction from the market was extremely positive — within two hours, it was reported that twenty-nine investors made offers totalling ZAR 4,3 billion in response to the inaugural ZAR 1 billion bond that was being auctioned. However, these experiences remain uneven in ways that demand more investigation — only a year earlier, the capital city of Dakar in Senegal had failed to attract investors this way. Meanwhile, Cape Town’s financing experiments have simultaneously provoked critiques for financial exclusions on the ground and unjust risk transfers to vulnerable urban communities.²⁵

Many of these tools are familiar in rich-country cities, again especially contexts like the United States with significant bond markets and a history of using them for new fiscal-financial experiments. Cities like Chicago have been particularly influential in developing and ‘exporting’ new PPP models and value capture innovations, often in partnership with major banks, transnational infrastructure developers and other private sector financial partners.²⁶ Another important reason for the growing popularity of these instruments in the United States has been the problem of decreasing federal funding for urban governments in the neoliberal era, forcing municipal governments to become more ‘entrepreneurial’ in seeking out external investment and financial sector partners.²⁷ Again, the broader institutional mandate to do so is also crucial; not all urban governments under austerity have the autonomy to undertake this kind of fiscal-financial experimentation. For example, despite similar experiences of austerity, UK cities including London still have strictly limited revenue-raising powers — though some UK urban governments have in recent years developed work-arounds that permit a degree of experimentation

22 Fitzgerald, J. (2010). *Emerald cities: Urban sustainability and economic development*. Oxford University Press; Glaeser, E. L., & Gottlieb, J. D. (2009). ‘The wealth of cities: Agglomeration economies and spatial equilibrium in the United States’, *Journal of Economic Literature*, 47(4), 983-1028.

23 Conversely, these kinds of density bonuses, including those captured for urban governments via value capture finance, suggest the problematic side to some densification interventions — that deployed in some urban contexts, they may generate new forms of ‘green’ or ‘climate’ gentrification. E.g., Knuth, S., Stehlin, J., & Millington, N. (2020). ‘Rethinking climate futures through urban fabrics:(De) growth, densification, and the politics of scale’. *Urban Geography*, 41(10), 1335-1343.

24 USAID (2019). *Financing Climate Resilience in African Cities A Reference Guide*. Washington, DC: USAID, Available at

https://www.climatelinks.org/sites/default/files/asset/document/2019-USAID_ATLAS-Financing_Climate_Resilience_in_African_Cities.pdf

25 Bigger, P., & Millington, N. (2020). ‘Getting soaked? Climate crisis, adaptation finance, and racialized austerity’ *Environment and Planning E: Nature and Space*, 3(3), 601-623.

26 For example, Ashton, P., Doussard, M., & Weber, R. (2016). ‘Reconstituting the state: City powers and exposures in Chicago’s infrastructure leases’. *Urban Studies*, 53(7), 1384-1400; Langley, P. (2018). ‘Frontier financialization: Urban infrastructure in the United Kingdom’. *Economic Anthropology*, 5(2), 172-184; O’Neill, P. (2017). ‘Managing the private financing of urban infrastructure’. *Urban Policy and Research*, 35(1), 32-43.

27 Harvey, D. (1989). ‘From managerialism to entrepreneurialism: the transformation in urban governance in late capitalism’.

Geografiska Annaler: Series B, Human Geography, 71(1), 3-17.

with US value capture tools like TIF;²⁸ UK cities have also developed cases of PPP usage for urban infrastructures.²⁹ Many of these urban financial innovations have provoked questioning in recent years, particularly during the financial crisis and its wave of urban bankruptcies;³⁰ nevertheless, they have seen growing adaptation internationally notwithstanding remaining institutional obstacles,³¹ now including for climate needs.

Green bond markets are more recent and have grown rapidly in the last decade.³² In part, these markets reflect broader trends in Environmental, Social, and Corporate Governance (ESG) and impact investing.³³ However, given that large shares of green bond investment now go toward renewable energy development,³⁴ it is also important to situate this bond investment within broader energy sector trends. Large ‘utility-scale’ renewable energy projects have strong economic cases and now attract mainstream investor interest, to the tune of USD 322 billion invested worldwide in 2018.³⁵ These successes in green bond markets raise concerns as well — how are cities to negotiate more and less profitable interventions, and will the latter be starved of capital? Do green bonds represent truly ‘additional’ measures, or attractive financing for programs cities already had in development?³⁶

A major challenge has been how to make climate interventions generate profits to fund these kinds of value capture and PPP instruments. For more difficult profitability sells like energy efficiency retrofitting, new proposed financial instruments like Property Assessed Clean Energy (PACE) seek to define and ‘assetise’ value-added for low-carbon building and retrofits — e.g., streams of measurable direct return on low-carbon investments, and a value premium for green building, that can be targeted by small or large-scale property owners and investors. These are the kinds of value-added needed to repay upfront retrofitting investments, in PACE’s case run through US municipal governments using special assessment tools, PPPs and often value capture finance in the form of municipal ‘PACE bonds’.³⁷ However, not all climate responses are likely to be profitable, particularly if they are made available to all. Both urban governments and prospective institutional partners like the World Bank face this problem.

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- 28 For example, Strickland, T. (2013). ‘The financialisation of urban development: Tax Increment Financing in Newcastle upon Tyne’. *Local Economy*, 28(4), 384-398.
- 29 Loftus, A., & March, H. (2016). ‘Financializing desalination: Rethinking the returns of big infrastructure’. *International Journal of Urban and Regional Research*, 40(1), 46-61; Loftus, A., & March, H. (2019). ‘Integrating what and for whom? Financialisation and the Thames Tideway Tunnel’. *Urban Studies*, 56(11), 2280-2296; Grafe, F. J., & Hilbrandt, H. (2019). ‘The temporalities of financialization: infrastructures, dominations and openings in the Thames Tideway Tunnel’. *City*, 23(4-5), 606-618; Langley, P. (2018). ‘Frontier financialization: Urban infrastructure in the United Kingdom’. *Economic Anthropology*, 5(2), 172-184.
- 30 For example, Peck, J. (2012). ‘Austerity urbanism: American cities under extreme economy’. *City*, 16(6), 626-655.
- 31 Chen, H. Y. (2020). ‘Cashing in on the sky: financialization and urban air rights in the Taipei Metropolitan Area’. *Regional Studies*, 54(2), 198-208; Pike, A., O’Brien, P., Strickland, T., & Tomanej, J. (2019). *Financialising city statecraft and infrastructure*. Edward Elgar Publishing.
- 32 For example, Bigger, P., & Webber, S. (2021). ‘Green structural adjustment in the World Bank’s resilient city’. *Annals of the American Association of Geographers*, 111(1), 36-51; Hilbrandt, H., & Grubbauer, M. (2020). ‘Standards and SSOs in the contested widening and deepening of financial markets: The arrival of Green Municipal Bonds in Mexico City’. *Environment and Planning A: Economy and Space*, 52(7), 1415-1433; Bridge, G., Bulkeley, H., Langley, P., & van Veelen, B. (2020). ‘Pluralizing and problematizing carbon finance’. *Progress in Human Geography*, 44(4), 724-742.
- 33 Cohen, D., & Rosenman, E. (2020). ‘From the school yard to the conservation area: Impact investment across the nature/social divide’. *Antipode*, 52(5), 1259-1285.
- 34 Bridge, G., Bulkeley, H., Langley, P., & van Veelen, B. (2020). ‘Pluralizing and problematizing carbon finance’. *Progress in Human Geography*, 44(4), 724-742.
- 35 International Renewable Energy Agency (IRENA) and Climate Policy Initiative (CPI) (2020). *Global Landscape of Renewable Energy Finance 2020*. International Renewable Energy Agency, Abu Dhabi.
- 36 Bigger, P., & Millington, N. (2020). ‘Getting soaked? Climate crisis, adaptation finance, and racialized austerity’. *Environment and Planning E: Nature and Space*, 3(3), 601-623.
- 37 Knuth, S. (2019). ‘Cities and planetary repair: The problem with climate retrofitting’. *Environment and Planning A: Economy and Space*, 51(2), 487-504; Knuth, S. (2016). ‘Seeing green in San Francisco: City as resource frontier’. *Antipode*, 48(3), 626-644.

Finally, many interventions prioritize making cities more ‘creditworthy’. A 2013 report from the World Bank³⁸ suggested that of the 500 largest cities in developing countries, only about 4% are creditworthy in international financial markets and 20% in local markets. As a result, institutions like the World Bank often urge cities to transform their governance to provide greater transparency and confidence to private investors. For example, one pathway recommended by the Urban Climate Change Network points out the need for advancing city creditworthiness, developing robust city institutions and participating in city networks enabling climate action. Similarly, governmental interventions to ‘de-risk’ private investment are widely recommended to cities, including by multilateral institutions like the World Bank: blended finance models seek to use public finance to subsidise and encourage private investment, making a business case to investors from the private sector.

At the same time, critics point to the danger that World Bank-supported reforms will structurally favour large banks and creditors over urban communities, a form of urban ‘green structural adjustment’ risked in new climate resilience financing.³⁹ Others similarly raise concerns about the growing influence of private finance in World Bank Programs, warning of the risks of a new ‘Wall Street Consensus’.⁴⁰ Such debates stand to shape futures of urban finance across many contexts, as legacies of neoliberal austerity confront proposals for revived state-led investment such as a ‘Green Recovery’ or ‘Green New Deal’.⁴¹

Persistent inequalities

Major inequalities persist in the ability of cities and urban communities to access investment needed, particularly in Least Developed Countries (LDCs), and the widely discussed ‘financing gap’ between currently available finance and climate-related investment needs remains a profound challenge. Despite the recent increase in climate financing reported by OECD, a more than USD 20 billion annual jump would be required to meet the USD 100 billion goal that developed countries have committed to mobilise for climate action in developing countries by 2020.⁴² In addition, a recent study observes that out of the USD 17.4 billion total of climate finance committed from international climate funds, less than 10% (USD 1.5 billion) was approved for locally focused climate change projects between 2003 and 2016.⁴³ Moreover, large amounts of investment are not tracked to measure impact, and there remain challenges of questionable additionality and ‘materiality’ where claims of impact are exaggerated.

Geographically, for the developing world much existing investment goes to China rather than being evenly spread across cities in other countries. Of course, Chinese cities face a substantial climate threat, the extent of which is underlined by 2021 flooding in the city of Zhengzhou, the capital of Henan Province. In the three-day period between July 20th and 22nd, this massive city of 6.7 million people was deluged with a normal year’s supply of rainfall. On the one hand, China’s major urban populations clearly need ongoing climate-related investment around these kinds of threats. On the other hand, we see chronically insufficient levels of funding for the Global South, particularly LDCs, who bear the brunt of and are less resilient

38 The World Bank (2013). *Planning and financing low-carbon, livable cities*, <https://www.worldbank.org/en/news/feature/2013/09/25/planning-financing-low-carbon-cities>, accessed 19 September 2021.

39 Bigger, P., & Webber, S. (2021). ‘Green structural adjustment in the World Bank’s resilient city’. *Annals of the American Association of Geographers*, 111(1), 36-51

40 Gabor, D. (2021). ‘The Wall Street Consensus’. *Development and Change*. OnlineFirst, <https://doi.org/10.1111/dech.12645>.

41 Aronoff, K., Battistoni, A., Cohen, D. A., & Riofrancos, T. (2019). *A planet to win: why we need a Green New Deal*. Verso Books; Pettifor, A. (2019). *The Case for the Green New Deal*. Verso: London.

42 OECD (2021). *Climate Finance Provided and Mobilised by Developed Countries: Aggregate Trends Updated with 2019 Data*. Climate Finance and the USD 100 Billion Goal. OECD Publishing: Paris.

43 IIED (n.d.). *Climate finance not reaching the local level*, <https://www.iied.org/climate-finance-not-reaching-local-level>, accessed 19 September 2021.

to climate change while lacking capacity to raise capital. For example, cities in South Asia and Sub-Saharan Africa have seen annual average investment of just USD 4 billion and USD 3 billion, respectively.

Most urban governments in the developing world, particularly in LDCs, face severe barriers to planning and financing key infrastructural investments (including in the housing sector) in line with SDGs and climate action goals — particularly doing so in an inclusive way that reaches the most vulnerable urban residents. Meanwhile, financial inequalities are pervasive and deepening within some rich-country cities, for example Black-majority cities and majority-minority neighbourhoods in the United States. In the US urban context, municipal bankruptcies in the late 2000s financial crisis (partially a result of predatory financial innovations marketed to urban governments in the 2000s) worsened longer histories of disinvestment, racial redlining and other forms of exclusion from finance and property insurance regimes.⁴⁴

Meanwhile, some interventions — e.g., utility-scale renewable energy as discussed above, particularly onshore wind and solar photovoltaic developments — receive disproportionate climate investment, while others struggle for funding. Mitigation still receives more investment than adaptation. In the renewable energy sector, distributed and community scale energy, public owners and more novel technologies have had a tougher time attracting affordable investment that ‘mature’ utility-scale technologies, increasingly developed and owned by large transnational corporations.⁴⁵ More broadly, the building and construction sector, waste, climate-smart water, renewable energy and electric vehicles have attracted the most attention and investment to date.

Finally, it is likewise necessary to understand the particular financing barriers and pathways for popular climate action proposals like urban ‘nature-based solutions’ and ‘smart surfaces’. Nature-based solutions are a form of eco-innovation in cities that specifically promotes nature as a means for providing solutions to climate change (mitigation and adaptation); for example, ‘green’ versus ‘grey’ flood control infrastructure. Public international funding to nature-based solutions for adaptation is still relatively small, accounting for only USD 3.8–8.7 billion, or approximately 0.6–1.4% of total climate finance flows and 1.5–3.4% of public climate finance flows in 2018.⁴⁶ Moreover, there is a risk that lenders may demand higher costs for their capital in financing these more experimental interventions.⁴⁷ Conversely, progress in normalising these infrastructures is suggested by the formation of the European Investment Bank’s Natural Capital Financing Facility (NCF). For example, a recent NCF loan to the City of Athens is intended to help the city implement the green infrastructure components of its resilience strategy.⁴⁸

44 Peck, J., & Whiteside, H. (2016). ‘Financializing Detroit’. *Economic Geography*, 92(3), 235-268; Ponder, C. S., & Omstedt, M. (2019). ‘The violence of municipal debt: From interest rate swaps to racialised harm in the Detroit water crisis’. *Geoforum*.

45 International Renewable Energy Agency (IRENA) and Climate Policy Initiative (CPI) (2020). *Global Landscape of Renewable Energy Finance 2020*. International Renewable Energy Agency, Abu Dhabi.

46 World Resources Institute (WRI) (2021). *Working Paper: Public International Funding of Nature-based Solutions for Adaptation: A Landscape Assessment*. Washington, DC: World Resources Institute. Available online at <https://doi.org/10.46830/wriwp.20.00065>.

47 Christophers, B. (2018). ‘Risk capital: Urban political ecology and entanglements of financial and environmental risk in Washington, DC’. *Environment and Planning E: Nature and Space*, 1(1-2), 144-164.

48 EIB (2021). *Athens Resilient City and Natural Capital* (NCF), <https://www.eib.org/en/projects/pipelines/all/20180050>, accessed 17 September 2021.

Policy Analysis and Recommendations

Despite bearing the least responsibility for climate change, urban governments in the developing world are often unable to access needed climate investment, and must receive existing funds indirectly.

- The technical and financial capacity of developing country cities and urban populations to access climate related funding should be built, in a way that allows urban governments and communities to define their own objectives in combatting climate change.
- This supported capacity-building will take advantage of stated COP26 goals to increase funding to developing countries, as well as growing investment in climate response, governmental and private. While doing so, it must exercise caution about the negative consequences of some financing pathways, such as predatory lending and unjust risk transfers (see below).

Proposition 2: Cities' climate investment needs are differentiated

Mitigation and adaptation present distinct needs

In building out new urban investment programs, it is important to reflect upon how mitigation and adaptation challenges vary by place, and may require distinct investments. Urban greenhouse gas emissions reduction programs often focus on decarbonising energy generation, distribution and consumption infrastructures, from electric power systems to natural gas grids to mobility and transit networks. Some of this low-carbon development includes 'greenfield' programs of mass building and eco-design.⁴⁹ However, because many emissions-generating practices are embedded in urban buildings and fabrics, retrofitting, repair and infrastructural replacement are also clear and distinctive investment needs (e.g., for energy efficiency in existing buildings, natural gas grid replacement, eco-efficient densification or improved transit and mobility infrastructures).⁵⁰ Meanwhile, cities must divest from, replace or transform existing emissions-intensive urban economies and infrastructures, targeting fossil energy but also sectors like heavy industry, logistics and construction. Divestment presents financial challenges around 'stranded' costs and assets that face premature devaluation, including within urban economies and infrastructures.⁵¹

Urban adaptation and resilience require their own investments. Resources needed vary by cities' exposure levels and major impacts faced (e.g., sea level rise, intensified storms, drought, wildfire). Many cities envision large-scale and expensive infrastructural responses, often for water control and supply (e.g., dams and levees, pumping systems, improved wastewater management systems, desalination). Social risk management infrastructures, particularly public and private re/insurance and government-supported disaster risk reduction measures, also demand investment and present a growing demand for catastrophic coverage solutions, as discussed above. Retrofitting and repair are again critical and distinct investment needs here, to existing infrastructural systems or 'climate-proofing' improvements at the individual property or community level (e.g., building energy and water use efficiency, hurricane hardening measures, building elevation).⁵² Conversations are growing about adaptation alternatives and their distinctive funding challenges, from green infrastructures to managed retreat from highly exposed urban locations.⁵³

According to the World Bank, 216 million people may be challenged by internal displacement due to climate change impacts.⁵⁴ These impacts and migration pathways vary across contexts. For example, in North Africa, water scarcity is projected to cause migration to water-rich cities such as Cairo, placing strain upon existing infrastructures there. Conversely, in the Mekong Delta, migration is projected due to sea level rise. The World Bank suggests that governments must plan for internal climate migration across all phases of migration — before, during,

49 See Sze, J. (2015). *Fantasy Islands: Chinese Dreams and Ecological Fears in an Age of Climate Crisis*. University of California Press.

50 Knuth, S., Stehlin, J., & Millington, N. (2020). 'Rethinking climate futures through urban fabrics:(De) growth, densification, and the politics of scale'. *Urban Geography*, 41(10), 1335-1343; McFarlane, C. (2016). 'The geographies of urban density: Topology, politics and the city'. *Progress in Human Geography*, 40(5), 629-648.

51 Knuth, S. (2017). 'Green devaluation: Disruption, divestment, and decommodification for a green economy'. *Capitalism Nature Socialism*, 28(1), 98-117.

52 For example, Knuth, S. (2019). 'Cities and planetary repair: The problem with climate retrofitting'. *Environment and Planning A: Economy and Space*, 51(2), 487-504.

53 For example, Koslov, L. (2016). 'The case for retreat'. *Public Culture*, 28(2), 359-387.

54 World Bank (2021). *Groundswell Part II: Acting on Internal Climate Migration*. Washington, DC: World Bank, Available at <https://openknowledge.worldbank.org/handle/10986/36248>

and after moving. Investments are also needed in research at scale, including more robust, granular data on projected climate impacts, to better contextualize and understand internal climate migration at the regional and country level. Crucial social scientific questions include deeper histories of rural-urban migration, and vulnerability across both exposed rural places and urban and per-urban informal settlements — particularly crucial in contexts like Bangladesh as climate migration initiatives are drawn into broader narratives of national agricultural-economic modernisation and corresponding urbanisation.⁵⁵

Given the high climate exposure of many of the world's cities, it is vital to coordinate mitigation and adaptation responses and investments. Most immediately, highly exposed cities and communities face particularly acute investment needs for both. These places, particularly in LDCs, need tailored international investment to address the unique urgency of their situation, including but not limited to priority access to financing. Meanwhile, low-carbon investments will be undermined if they do not simultaneously account for climate risks and impacts like failing insurance regimes. For example, climate-proofing improvements like home energy efficiency may simultaneously lower building emissions and improve resilience in place, but losing insurance coverage threatens to more broadly devalue these properties and force retreat.

Strategic choices make a difference

Strategic choices made in how and at what scale to target responses make for differentiated resourcing needs and pathways. Not only will interventions be more or less expensive, but they stand to inherit different place-specific legacies of urban finance, instruments, players and politics. These pathways matter for how the costs, value benefits and risks of investments are distributed among different players — households and communities, urban and national governments, multilateral institutions and development funders, differentiated private financial players and beyond. Existing models suggest that the current toolkits likely to be adapted to new climate challenges should be common but differentiated, not a one size fits all approach.

As discussed above, many interventions target cities' infrastructural systems and networks, existing and new, and again frequently seek to adapt commonly used infrastructure finance tools such as project finance and PPPs to new challenges and urban contexts. Others, like retrofitting programs geared toward homeowners or commercial property owners, may inherit existing mass property lending instruments like asset-backed securitization (ABS).⁵⁶ Newer value capture instruments discussed above go beyond older public finance tools like general obligation bonds, loans backed with cities' 'full faith and credit' (evaluated by private credit rating agencies) and repaid through the general fund, typically via property taxes. The new bonds under consideration are considerably more complicated and opaque, suggesting new possibilities for innovative finance, but also important questions of governance — should new municipal bond measures require a vote? — and growing total debt loads on urban populations.⁵⁷ As discussed, many of these infrastructure finance forms are now being actively adapted as climate financing tools.

55 For instance, Paprocki, K. (2018). 'Threatening dystopias: Development and adaptation regimes in Bangladesh'. *Annals of the American Association of Geographers*, 108(4), 955-973; Paprocki, K. (2020). 'The climate change of your desires: Climate migration and imaginaries of urban and rural climate futures'. *Environment and Planning D: Society and Space*, 38(2), 248-266.

56 For example, Knuth, S. (2019). 'Cities and planetary repair: The problem with climate retrofitting'. *Environment and Planning A: Economy and Space*, 51(2), 487-504.

57 Sbragia, A. M. (1996). *Debt Wish: Entrepreneurial Cities, US Federalism, and Economic Development*. Pittsburgh, PA: University of Pittsburgh Press.

Differentiated investment needs and objectives make for differentiation in proposed borrowers and/or investment recipients, and a range of significant organisational differences and power disparities. Financial players' pathways to profitability, and corresponding interest in investment, vary depending on the form of that investment. For example, investors may or may not act as lenders — to the public sector, or more and less powerful private players with varying ability to negotiate the terms of relationships, rated 'riskiness' and so forth. Financial players like private equity may also act as direct investors and owners or part-owners, claiming a certain share of and priority in project returns in return for their capital. At a finer-grained level, objectives and players vary widely, in risks that regulators allow them to bear and in the premium they may level on their capital or loan interest rates. Some institutions like public pension funds are typically constrained by regulators, prevented from investing in assets deemed too risky.

Again, debates over how to finance urban interventions cannot be detached from broader questions about cities' capacity to lead on certain climate change responses. Access to both municipal and outside financial resources, public sector or private, is likely to be necessary for many measures, and not all climate responses deployed in and for cities will be led primarily by urban governments. This is again particularly so in national contexts where more centralised governments limit cities' formal powers and/or fiscal autonomy but is likewise true for interventions where the scale of financial resources required stands to overwhelm cities' capacity or requires long planning horizons under conditions of climate-related uncertainty.⁵⁸ For example, major dam projects have typically been financed by national governments and sovereign debt, frequently with development aid. Similarly, the US National Flood Insurance Program (NFIP), an important example of a publicly subsidised insurance program, provides a crucial resource to urban property markets but leans on national resources — and still faces an existential challenge in affording the cost of increasingly expensive weather disasters.⁵⁹

Legacy inequalities matter

Cities and urban communities face climate change and its investment needs from unequal starting points. Existing vulnerabilities to acute and chronic climate impacts are highly uneven, shaped by legacy inequalities and neo-colonial patterns. Rich-country cities may draw on existing infrastructural investments in formulating responses, a resource unavailable to many developing country cities — even if some legacy investments like large-scale wildfire suppression impose unforeseen urban costs today. In the present, cities face uneven internal resources available, assistance available from national or regional governments and access to external finance. Cities are differentially able to access new climate-related financing, pay different costs for this investment and command disparate negotiating power with investors.

Unequal investment capacities matter in self-reinforcing ways. For example, many urban mitigation measures are framed as 'win-win' interventions; building useful urban infrastructure like mass transit and low-carbon energy systems and promoting green economic development in innovative sectors like electric vehicle infrastructure, smart grids and advanced battery storage.⁶⁰ However, these interventions are biased in favour of rich cities and the developed world, contexts with the technical expertise and financial muscle to achieve them. Many rich-country governments similarly support and subsidise advanced low-carbon technologies

58 Conversations with a substantial history, e.g. Betsill, M., & Bulkeley, H. (2007). 'Looking back and thinking ahead: a decade of cities and climate change research'. *Local environment*, 12(5), 447-456.

59 Elliott, R. (2021). *Underwater: Loss, Flood Insurance, and the Moral Economy of Climate Change in the United States*. New York: Columbia University Press.

60 <https://www.c40.org/ending-climate-change-begins-in-the-city>

and urban innovation clusters as part of overt or de facto industrial policy, over and above private financial resources available via corporate investors, venture capital or expanding green bond markets.⁶¹ Alongside legal monopolies like intellectual property enforcement, this uneven playing field for new climate solutions reinforces privileged access, rent extraction and wealth in existing centres at the expense of opportunities for other cities and urban communities.

At the same time, the costs of resource extraction economies old and new — from fossil fuels and other high-carbon legacies to new forms of resource extraction for the green economy — are unequally distributed across cities and their peripheries. For example, the financial risks of decarbonisation have frequently been framed in terms of systemic financial risk (i.e. a ‘carbon bubble’)⁶² and targeted as such by emerging financial risk disclosure and central bank stress-testing regimes — though with substantial questions.⁶³ However, divestment will differentially affect urban economies and frontline workers. Historical experiences of mine closures, deindustrialisation and urban-regional disinvestment in and beyond the United Kingdom underline the need for just transition and reinvestment — including as such experiences fuel new populist resistance to climate action in both the Global North and South.⁶⁴ Meanwhile rich cities benefit from new forms of ‘green extractivism’ at the expense of developing countries and rural peripheries — for example, much coltan and lithium used for car batteries is currently sourced under exploitative and polluting conditions in places such as the Democratic Republic of Congo and South America’s ‘Lithium Triangle’, and fast-growing extraction in sites like Nevada raises concerns for indigenous peoples’ land rights and environmental justice.⁶⁵ Taken overall, concerning elements of climate neo-colonialism are emerging wherein solutions, finance and technical capacity further concentrate in wealthier counties and cities.

Embedded inequalities and injustice *within* cities and urban contexts matter as well. For example, gender inequality across multiple urban contexts can be intensified or augmented by climate change policies, and women have been disproportionately affected by climate change. Similarly, even in rich-country contexts like the United States, climate responses and investment politics are shaped by deep-rooted legacies of racial ‘redlining’, blocking Black and minority communities from mortgages, property insurance and other financial resources. Alongside structural disinvestment and similar financial exclusions affecting Black-majority cities, these and other racial capitalist legacies shape experiences of precarity and re/investment requirements today — and are frequently reinforced by fresh rounds of unequal capital access and affordability, when historically disinvested cities and communities are deemed less ‘creditworthy’ for reparative investments needed, while frequently targeted for new forms of disaster capitalism.⁶⁶ It is crucial that climate investments are deployed in

61 Mazzucato, M. (2011). ‘The entrepreneurial state’. *Soundings*, 49(49), 131-142; Knuth, S. (2018). “Breakthroughs” for a green economy? Financialization and clean energy transition. *Energy Research & Social Science*, 41, 220-229.

62 <https://carbontracker.org/>

63 Christophers, B. (2017). ‘Climate change and financial instability: Risk disclosure and the problematics of neoliberal governance’. *Annals of the American Association of Geographers*, 107(5), 1108-1127; Langley, P., & Morris, J. H. (2020). ‘Central banks: Climate governors of last resort?’ *Environment and Planning A: Economy and Space*, 52(8), 1471-1479.

64 Massey, D. (1995). *Spatial divisions of labour: social structures and the geography of production*. Macmillan International Higher Education.; Hudson, R. (2005). ‘Rethinking change in old industrial regions: reflecting on the experiences of North East England’. *Environment and planning A*, 37(4), 581-596; Pike, A. (2020). ‘Coping with deindustrialization in the global North and South’. *International Journal of Urban Sciences*, 1-22; MacLeod, G., & Jones, M. (2018). ‘Explaining ‘Brexit capital’: uneven development and the austerity state’. *Space and polity*, 22(2), 111-136.

65 Riofrancos, T. (2020). *Resource radicals: From petro-nationalism to post-extractivism in Ecuador*. Duke University Press; Klinger, J. M. (2018). *Rare earth frontiers: From terrestrial subsoils to lunar landscapes*. Cornell University Press.

66 For example, Ponder, C. S. (2021). ‘Spatializing the Municipal Bond Market: Urban Resilience under Racial Capitalism’. *Annals of the American Association of Geographers*, 1-18; Ranganathan, M., & Bratman, E. (2021). ‘From urban resilience to abolitionist climate justice in Washington, DC’. *Antipode*, 53(1), 115-137; Klein, N. (2018). *The battle for paradise: Puerto Rico takes on the disaster capitalists*. Haymarket Books.

just ways that tackle such place-rooted legacies of injustice, socially produced climate vulnerabilities and compounding resource exclusions — along lines of class, caste, racialised and gender disparity, human rights, workers' rights and more.

Policy Analysis and Recommendations

The diverse nature of cities and urban populations, their climate risks and needs makes for differentiated climate investment requirements.

- Investment should be prioritised for cities most at risk from climate change, particularly in LDCs; for example, in highly exposed coastal areas. This investment must also take note of how infrastructural and social factors affect such cities' and communities' (uneven) vulnerability to climate change.

Urban communities begin at dissimilar starting points, and these legacies — from embedded colonial and resource extraction histories to gendered, raced and classed inequalities within cities themselves — matter for climate interventions.

- These legacy inequalities must be recognised within policy and financing agendas — or that agenda risks perpetuating and deepening them. True resourcing solutions should not be concentrated around wealth and technical capacity but rather prioritise inclusivity, actively seeking out those most disadvantaged and historically marginalised.

Proposition 3: More just investment requires transformative practice

Finally, the *quantity* of investment needed is not the only crucial question facing cities: the form and terms of that investment matter for just outcomes.

‘Maladaptive investment’

In a recent intervention advocating more ‘transformative’ climate adaptation responses, authors warn of the potential for ‘maladaptive’ investment if underlying structural inequalities and systemic causation are ignored in climate response.⁶⁷ One important example here is the legacy of the subprime crisis. The late 2000s financial crisis is a cautionary reminder about the perils of urban financial and fiscal innovation gone wrong — without proper deliberation, climate-related financial innovations risk perpetuating practices such as predatory lending, unjust risk transfers, growing ‘shadow’ debt on urban communities, municipal bankruptcies and more systemic failures. For example, PACE loans have been accessed of subprime loan-like risks during their 2010s rollout in the United States, a serious concern for US consumer advocates and regulators.⁶⁸ Meanwhile, new climate risks are already risking US municipal bond downgrades for highly exposed cities, risking perverse outcomes⁶⁹ — cities most in need of climate-related investment least able to access it, or access it at affordable prices and on just terms.

Legacies of structural adjustment present a similar negative example, and suggest the politics embedded in loans to developing countries versus other options like grants — particularly given ongoing debates over existing loan forgiveness, and questions of ‘ecological debt’ and ‘climate reparations’ due to developing countries disproportionately harmed by climate change. Another critical question is the risk of ‘green’ or ‘climate’ gentrification as an outcome of climate-related investments, including new gentrification pathways emerging around differential climate risk exposure within urban neighbourhoods.⁷⁰

Both gentrification and more direct ‘slum clearance’ programs waged in the name of climate change response and ‘world class’ city development⁷¹ threaten perverse outcomes for informal settlements and the most vulnerable. UN HABITAT identifies a particularly acute climate risk to informal settlements as stemming from three factors: frequently highly exposed physical location, socio-economic vulnerability of residents and these areas’ political and institutional marginalisation.⁷² Recent climate risk-justified clearances threaten to exacerbate these harms. For example, displacements in cities like Manila and Jakarta have raised questions about profit motivations for redevelopment and ‘upscaling’ of existing waterside sites, while informal settlements are displaced to far-flung urban peripheries — as or more risky than sites they had traditionally inhabited.⁷³

67 Shi, L., & Moser, S. (2021). ‘Transformative climate adaptation in the United States: Trends and prospects’. *Science*.
68 ABA Journal (2020). ‘FHFA weighs more forceful action on ‘continued threat’ of PACE loans’, 15 January, available at <https://bankingjournal.aba.com/2020/01/fhfa-weighs-more-forceful-action-on-continued-threat-of-pace-loans/>.

69 Grove, K., Cox, S., & Barnett, A. (2020). ‘Racializing resilience: assemblage, critique, and contested futures in Greater Miami resilience planning’. *Annals of the American Association of Geographers*, 110(5), 1613-1630.

70 Anguelovski, I., Connolly, J. J., Pearsall, H., Shokry, G., Checker, M., Maantay, J., ... & Roberts, J. T. (2019). ‘Opinion: Why green “climate gentrification” threatens poor and vulnerable populations’. *Proceedings of the National Academy of Sciences*, 116(52), 26139-26143.

71 Ghertner, D. A. (2015). *Rule by Aesthetics: World-Class City Making in Delhi*. Oxford: Oxford University Press.

72 UN HABITAT (2018) *Addressing the most vulnerable first – Pro poor climate action in informal settlements* UN HABITAT

73 Yarina, L. (2018). ‘Your sea wall won’t save you’. *Places Journal*. <https://placesjournal.org/article/your-sea-wall-wont-save-you/>.

Conversely, recent research suggests that ‘slum upgrading’, improving the state of informal settlements in place without forced removal and demolition, can simultaneously tackle pre-existing socio-economic issues and advance climate change adaptation and mitigation goals (e.g., land management shifts, improved energy efficiency of dwellings). Local governments in the developing world, where most informal settlements are located, typically lack the financial and technical capacity to build resilience among this segment of the urban population; moreover, upgrading of settlements is not typically seen as a climate adaptation mechanism.⁷⁴ However, even if not designed as such, upgrading has the potential to serve as a building block in building urban resilience, adaptation and disaster risk reduction, particularly when integrated with new funding models.⁷⁵ These interventions will be more effective still if done in tandem with city-wide approaches such as provision of water, sanitation and hygiene services — services long normalised in the developed world.

Deeper questions still include the kinds of low-carbon futures loans and other instruments enable or foreclose. For example, will crucial low-carbon infrastructures be owned by the public sector or privatised? Are mass property ownership and consumer financial pathways a priority for cities, or will they prioritise public ownership options in sectors like low-carbon energy infrastructure and housing? What urban communities will be included and excluded in each case, and with what justice outcomes? Who bears repayment responsibilities and risks associated with new ‘climate debt’? Of rescuing debtors — or creditors — if proposed financial innovations fail?

All the questions above have a history and will be shaped by place-specific experience and options available. To them are added new climate-specific dilemmas: what kinds of climate responses, and for what kinds of cities and urban communities, are likely to be profitable for private or public sector investors... and which are not? Low versus high risk? What does that mean for their ability (or not) to attract private financial capital, and to do so at affordable rates and on favourable terms? While new financial innovations like ILS have been marketed as rendering some climate interventions more ‘investable’, profound questions remain.

More deeply, *should* all climate investments be profitable? Urban governments must think carefully here, including what answers mean for private financial involvement. Public sector subsidies to private finance are frequently framed as ‘unlocking’ and ‘leveraging’ resources beyond public capacity: when is or isn’t that true, to what extent do these privatised pathways socialise the costs of investment while privatising its profits, and do urban governments have alternate choices? (This question comes up with increasing frequency, for example, in renewable energy development, as an increasingly mainstream and profitable sector sees an investor rush on many developed country sites, yet private investors remain unwilling to invest in many LDCs without government assistance to subsidise and ‘de-risk’ that investment.)⁷⁶ What is to be done about crucial interventions without a clear ability to generate direct returns for private or public investors? Significant justice tensions exist — for example, around accountability to urban populations and communities, particularly around urban services delivery and tenure rights for informal communities, versus accountability to outside investors and profit expectations.

74 Collado, J. R. N., & Wang, H. H. (2020). ‘Slum upgrading and climate change adaptation and mitigation: Lessons from Latin America’. *Cities*, 104, 102791. <https://www.sciencedirect.com/science/article/abs/pii/S0264275119301040?via%2Fihp> viewed on 18 Oct 21

75 Satterthwaite, D., Archer, D., Colenbrander, S., Dodman, D., Hardoy, J., Mitlin, D., & Patel, S. (2020). ‘Building resilience to climate change in informal settlements’. *One Earth*, 2(2), 143-156.

76 International Renewable Energy Agency (IRENA) and Climate Policy Initiative (CPI) (2020). *Global Landscape of Renewable Energy Finance 2020*. International Renewable Energy Agency, Abu Dhabi.

More deeply still, this question speaks to debates over ‘green growth’, ‘degrowth’ and how instruments like debt lock growth paradigms in, presenting an obstacle to alternate climate futures.

Broader governance questions and principles

Finally, making climate investment just and tackling its toughest challenges requires more transformative practice; a range of emerging programs internationally suggest potential pathways and governance lessons. The broader state role in urban investment is an evolving question globally. A new wave of ambitious investment programs like a ‘Green Marshall Plan’, ‘Green New Deal’ or ‘Green Recovery’ confront existing neoliberal and ‘entrepreneurial’ models of urban financing. These progressive alternatives speak to other complementary mobilisations like the Just Transition movement. These diverse movements need to develop deeper conversations around climate change and its urban inequalities, including across legacy North-South divides. Meanwhile, new players like China’s Belt and Road Initiative stand to reshape patterns of urban and regional investment in ways that demand more understanding and public scholarship. All of these programs need to be linked with common aims and financing at the global, national and local level including the SDGs and regional and national Climate Action Plans. More broadly still, they need investment facilities to justly meet the challenge of climate migration; a global climate reparations facility (GCRF) is recommended to address the deep inequalities discussed throughout this briefing. At the UN negotiations, historical emissions underpin the claims for climate justice made by developing nations, along with the disparity in the wealth of nations.⁷⁷

Finally, various general principles are worth considering here. For example, subsidiarity, a guiding principle for the European Union, is arguably under-applied within urban climate finance, including as a guiding principle for large-scale programs of investment. Despite important commonalities and shared challenges, cities and towns globally are very diverse, including in their climate change exposures and vulnerabilities. Hence, place- and city-specific approaches and measures are necessary. The literature identifies best practices for climate finance in cities to be highly contextually rooted, with support required at every level from multiple stakeholders. Urban and municipal governments may be best placed to understand, plan and execute some mitigation and adaptation projects. Similarly, diverse urban communities (e.g., indigenous peoples and historically marginalised racial and ethnic groups, women, youth, the differently abled) stand to make an important contribution in defining and assert their needs, as well as in successfully executing these projects. However, neither are always empowered to do so by national governments.

⁷⁷ Carrington, D. (2021). ‘Historical climate emissions reveal responsibility of big polluting nations’, *The Guardian* 5 October, available at <https://www.theguardian.com/environment/2021/oct/05/historical-climate-emissions-big-polluting-nations>

Policy Analysis and Recommendations

Climate financial and fiscal instruments directed toward cities and urban communities, particularly those historically marginalised, must not repeat financial exclusions and extractions of the past.

- Climate finance must be both accessible and affordable, and must institute consumer protections around predatory targeting and terms, unjust risk transfers and other problems.

When looking at climate finance, numerous questions arise around the question of profitability and that of public good, and what debates over green growth, degrowth and other major economic decisions mean for urban futures.

- This requires a paradigm shift for which the Just Transition movement might be used as a starting point, in making a commitment to climate action that does not further entrench inequalities. The overall goals of the climate movement need to be highly contextual while adhering to local, national, regional and global aims for climate action. Stakeholder participation at all levels then is key.

Conclusion

Finally, moving out and up, how can a unified approach be formed to not only ensure coordination in facing what is a global borderless threat but to make approaches at the local, national and global level complement each other? How can these approaches work towards both broad and local targets while augmenting gender equity, poverty alleviation, equality improvements and other priorities contained in the SDGs? Funding allocated to climate change needs to be earmarked specifically for cities, as well as for the most vulnerable populations and areas to enable them to be at the forefront of fighting climate change. Coordination is key here if major COP26 goals are to be fulfilled in an effective and just way.

Climate change challenges and the pandemic have highlighted the need for integrated and context-specific interventions to deal with global problems, while underlining deep pre-existing inequalities shaping the global urban landscape. As Sheela Patel of Slum Dwellers International argues,

*We urgently need a 'new normal' to address both the old challenge of inequality and the emerging challenge of climate change. We cannot do one thing at a time. If we do not prevent climate change, we will not eradicate poverty: floods, heatwaves, food shortages and water scarcity will devastate the lives and livelihoods of millions of people. And if we do not eradicate poverty, we cannot prevent climate change: an informed, engaged, empowered citizenry will be key to achieving net-zero emissions. We need bottom-up action to meet with top-down possibilities. National governments must work with urban dwellers, including those who are poor and vulnerable, if they are to achieve the Sustainable Development Goals and Paris Agreement.*⁷⁸

⁷⁸ In Coalition for Urban Transitions (2019). *Climate Emergency, Urban Opportunity: How National Governments can Secure Economic Prosperity and Avert Climate Catastrophe by Transforming Cities*. Washington, DC: Coalition for Urban Transitions, World Resources Institute, p. 4.

The issues highlighted in this brief are linked directly to the COP26 themes as summarised in the table below:

Linkages to COP26 themes

| Themes ⁷⁹ | Relevance to cities |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Secure global net zero by mid-century and keep 1.5 degrees within reach</p> <p>To deliver on these stretching targets, countries will need to:</p> <ul style="list-style-type: none"> • Accelerate the phase-out of coal • Curtail deforestation • Speed up the switch to electric vehicles • Encourage investment in renewables. | <ol style="list-style-type: none"> I. Investment in renewables can be focussed on cities and urban populations not benefiting from current investment booms, particularly in LDCs; this investment should be designed to empower communities (e.g., via alternate ownership models rather than growing transnational private monopolies). Finance for developing cities must equally prioritise the more difficult funding challenge of adaptation as renewables become more profitable, and an easier financial sell. II. Like many other ‘win-win’ urban greening responses discussed here, the switch to electric vehicles is biased in favour of the developed world, rich cities that have most technical and financial muscle to achieve it. Both equity in investment and the differentiated needs of different kinds of cities and urban communities must be questioned here. |
| <p>Adapt to protect communities and natural habitats</p> <p>At COP26 we need to work together to enable and encourage countries affected by climate change to:</p> <ul style="list-style-type: none"> • Protect and restore ecosystems • Build defences, warning systems and resilient infrastructure and agriculture to avoid loss of homes, livelihoods and even lives. | <ol style="list-style-type: none"> I. Cities have particularly acute investment needs for resilient infrastructures, warning systems and defences, as sites where populations are concentrated — threatening acute loss of homes, livelihoods and lives. LDC cities are less resilient to climate change and should receive greater attention in the allocation of adaptation resources. II. Certain cities (e.g., those in low-lying deltas and coasts) are particularly at risk and defences and resilience must be built at these locations, with differentiated needs around climate migration and informal settlements considered. These tasks are acutely in need of priority climate finance, justly and deliberatively administered. |

⁷⁹ UN Climate Change Conference 2021 (2021) COP 26 Goals, <https://ukcop26.org/cop26-goals/>, accessed 12 October 2021.

| Themes | Relevance to cities |
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| <p>Mobilise finance</p> <p>To deliver on our first two goals, developed countries must make good on their promise to mobilise at least USD 100 billion in climate finance per year by 2020.</p> <p>International financial institutions must play their part and we need to work towards unleashing the trillions in private and public sector finance required to secure global net zero.</p> | <p>I. More financial resources are required by cities; accessing needed resources for climate response is a pressing challenge faced by many cities, particularly in the developing world and LDCs. Urban governments and communities need capacity to secure and manage this finance, and transformations in cities would greatly aid the global net zero goal.</p> |
| <p>Work together to deliver</p> <p>We can only rise to the challenges of the climate crisis by working together.</p> <p>At COP26 we must:</p> <ul style="list-style-type: none"> • Finalise the Paris rulebook (the detailed rules that make the Paris agreement operational) • Accelerate action to tackle the climate crisis through collaboration between governments, businesses, and civil society. | <p>I. Implementing the Paris includes the Katowice Agreement, which comprises elements such as a transparency framework, technology transfer and capacity-building for developing countries.⁸⁰ Many of these principles can be applied to urban governments and communities, and cohere with the recommendations here.</p> <p>II. The goal of working together to deliver speaks to the kind of collaboration frequently called for between governments, the private sector and civil society needed to meet challenges in urban climate finance. Collaborations between and within cities can advance their ability to meet common challenges despite their differentiated needs. Within these collaborations, it is imperative to recognize and elevate the voices of historically marginalised urban communities.</p> |

80 UNFCCC (2021) *The Katowice Climate Change Package: making the Paris Agreement work for all*, <https://unfccc.int/process-and-meetings/the-paris-agreement/katowice-climate-package#eq-7>, accessed 12 Oct 2021.

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