



Overview Note on “Financing a Resilient Urban Future: Innovative Finance Instruments for Infrastructure”*



Every week, up to 1.4 million people are moving into urban areas. By 2045, the number of people living in cities will increase by 1.5 times to 6 billion, raising a variety of questions about how cities will develop physically, demographically, economically and technologically. Each dimension has profound implications for the infrastructure necessary to facilitate – or manage – these changes. Climate change exacerbates the challenges of urbanization and adds to existent disaster risks.

Climate-proofing of existing or newly built critical urban infrastructure is key to respond to climate-related disasters. A key question is: where to find the financial resources required for urban infrastructure system upgrades, additional maintenance measures or new infrastructure systems that are able to withstand increasing climate risks?



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This overview note has been developed based on information and ideas contained in variety of sources, including the World Bank Group's Policy Brief „Financing a Resilient Urban Future: A Policy Brief on World Bank and Global Experience in Financing Climate-Resilient Urban Infrastructure” (WBG, Hammer et al., 2018). A special note of thanks goes to colleagues from the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) for scoping, drafting and providing relevant examples.

Drawing on lessons from the World Bank Group and global experience on financing climate resilient urban infrastructure, this overview note identifies innovative approaches and new pathways for financing climate resilient urban infrastructure. It draws on recent experiences and innovative approaches from multilateral development banks and bilateral development partners' portfolios, on best practices applied on the ground in developing and developed countries and a larger literature review. It aims to provide policy makers and financial institutions in G20 and beyond with guidance on how to design, combine and support efforts for financing climate resilient urban infrastructure at different scales and in varying contexts.

The overview note examines the three most essential and interlinked urban infrastructure systems: water, transport, and energy. These sectors are the most vulnerable to climate risks in urban contexts with the most urgent need for climate resilient infrastructure investment strategies.

The overview note serves as a contribution to the **G20 Adaptation Work Program** as well as to the OECD, UN Environment and World Bank Group project **Financing Climate Futures: Rethinking Infrastructure** – both mandates from the G20 Hamburg Climate and Energy Action Plan for Growth. Beyond the work of the G20 Climate Sustainability Working Group, several other G20 working groups have covered infrastructure issues. The recommendations of this overview note can feed into many of these, as resilient infrastructure in cities touches on many highly relevant discussions.



1. Urban Water System

Water supply, wastewater treatment, and storm water management systems are quite differently affected by climate change. Impacts range inter alia from limited water availability or flood-induced damages on system assets (direct impacts) to overall increases in the level and timing of demand due to rising heat levels (indirect impact).

1.1 Financing Example

Washington DC's water and sewer agency recently issued the country's first **environmental impact bond** which pays investors a higher rate of return, if key environmental objectives are achieved by the investment projects (or charges them a premium if they are not achieved). The bond's USD 25 million in proceeds will be used for the installation of green infrastructure to absorb and slow surges of storm water around the city during heavy rains.



2. Urban Transport System

Most climate impacts on urban transport systems will be felt directly, such as heat waves, flooding, or sea level rise that may damage or impede use of certain segments of transport systems. Therefore, urban transport systems will likely see their maintenance expenses increase over time in the context of climate change.

2.1 Financing Example

Project preparation facilities significantly strengthen public entities' capacities in accessing public and private financing to deal with climate impacts in urban transport systems. The C40 Cities Finance Facility (CFF), in partnership with the Inter-American Development Bank (IDB) and the World Resources Institute (WRI), is supporting Bogotá to develop the 'Quinto Centenario' Bikeway, which will epitomize the city's vision on integrated, climate-friendly and resilient mobility. This 25 km-long cycle highway will connect citizens from different neighborhoods with jobs, schools and recreational opportunities, while simultaneously increasing the resilience of the city's transport system as a whole, and will support approximately 34,000 bicycle trips in the morning peak hours.



3. Urban Energy System

Climate change may disrupt energy system operations or even cause entire system breakdowns. This implies significant capital or operating cost implications. In fewer cases, climate impacts can also result in lower repair or maintenance costs, e.g. if reductions in snow or ice levels reduce damages on above ground distribution wires.

3.1 Financing Example

Most of the dedicated global climate funds, such as the Green Climate Fund (GCF), identified resilient energy systems as a funding priority. One example is the project in Tajikistan on renewing hydropower plants dependent on river basins fed by glacial melt water and snow melt. The GCF supplies USD 50 million in loans and grants (leveraging an additional USD 83 million in government and private sector resources) to adapt to significant predicted changes in the dynamics of the Tajik precipitation patterns as well as alterations to the country's glaciers.

OVERVIEW OF MAIN MECHANISMS FOR FINANCING CLIMATE RESILIENT URBAN INFRASTRUCTURE SYSTEMS

- **Comprehensive asset management strategies** that consider near and long-term cost burdens associated with climate and disaster risks serve as essential cost containment strategies. For example, in the Pacific Islands every dollar of routine infrastructure maintenance that does not take climate and disaster risk impacts on infrastructure systems into account, will end up costing USD 5 in repairs, or ultimately USD 25 in rehabilitation or reconstruction.
- **Creation of taxes with a dedicated resilience focus** is still a new phenomenon. Many cities, however, subsidize water system operations through general tax revenues. In the U.S., more than 1,300 government jurisdictions or water authorities impose some type of storm water fee to help pay for local storm water control measures. Where local authorities establish such taxes, policy makers must identify from the outset: who gets taxed, on what basis, and how the funds will be used and reported.
- **Land Value Capture (LVC)** is a policy approach that enables communities to benefit from land value increases by recovering and reinvesting in their land. Common LVC tools include inter alia transferable development rights, betterment contributions or public land leasing. The city of Sao Paulo generated, via auctions of „development rights“ or land use certificates (Certificados de Potencial Adicional de Construção), several billion USD within one decade that are now available for investments in infrastructure.
- **Bonds** are used to support long-term capital upgrades and are a well-worn strategy in many cities worldwide. Growing interest in **green bonds** that are specifically earmarked to be used for climate and environmental projects is noteworthy, although little of the funds raised have specifically targeted adaptation investments to date. Fiji, as a first developing nation, issued a green bond that creates a market for private investment opportunities specifically targeted to climate resilience and adaptation in 2017. Whether this is an area of potential growth needs to be further explored, particularly in country contexts where local authorities do not have bond issuance rights or where government resources are still limited (please compare financing example 1.1).
- Insurance companies created **catastrophe bonds** as reinsurance mechanisms against extreme weather events and natural disasters. In many cities, infrastructure system operators use these bonds to help them build financial resilience against extreme weather events. One example is FONDEN, Mexico's natural disaster fund, that was created to rapidly allocate federal funds for rehabilitation of public infrastructure affected by adverse natural events.
- **The establishment of dedicated Finance Facilities** serves to strengthen resilience by offering financing support for critical infrastructure facilities affected by major disasters. These facilities could also be used for risk reduction efforts to prepare for major events. One example is the Energy Resilience Bank established in the U.S. in the wake of Hurricane Sandy. However, policy makers must consider in advance how these finance facilities can be initially capitalized and whether there is a strategy to replenish the facility over time.
- **Dedicated global climate funds** (CIF-PPCR, GCF, LDCF and SCCF, Adaptation Fund) increasingly take adaptation projects in their portfolios, as recently found out by World Bank Group assessments. Their energy, water and transport infrastructure projects are worth over USD 1 billion, leveraging an additional USD 2.5 billion in public and private co-finance. By far the lion's share of these resources – around 71 percent – have focused on climate adaptation upgrades in the water sector.
- **Project preparation facilities** enable cities of developing countries with limited access to international funds to develop climate-resilient urban infrastructure projects. Project preparation facilities, such as the C40 Cities Finance Facility (CFF) and the World Bank Group's City Resilience Program (CPR) help to address the challenge of translating adaptation efforts into real business cases at investment level and to define a return of investment on resilience (please compare financing example 2.1).
- **Official Development Assistance (ODA)** will likely remain an outsized resource for infrastructure projects (system expansion or upgrades) in developing countries' cities. According to the OECD (2017), between 2013 and 2015, development aid of over USD 13 billion per year and about USD 9 billion per year was targeted at the water and sanitation sectors, while around USD 9 billion per year was allocated to the transport sector. The urban fraction as well as the proportion of funding allotted to climate adaptation of this total is unclear. The growing level of ODA is an important trend and is crucial for leveraging additional finance and delivering climate (co-)benefits, although how much further this can expand remains an open question.

PROPOSED ACTIONABLE RECOMMENDATIONS FOR POLICY MAKERS OF G20 AND DEVELOPING COUNTRIES

Building on the identified approaches and best practices, policy makers from G20 and beyond could promote a set of activities designed to advance efforts for financing climate resilient urban infrastructure, as appropriate. Specifically, the following activities at the supranational, national, and subnational levels are promising:

- 1 Address climate and disaster risks coherently in infrastructure planning and public investment.** Complement traditional planning processes with future-proofing infrastructure plans: identify future infrastructure demand and required investments, while taking climate risks and other trends into account (e.g. underlying economic growth, local geography, technology developments, institutional capacities and emerging business models). Thereby, future adaptation and disaster response costs will be avoided.
- 2 Align public finance flows with needs for new climate resilient infrastructure and upgrades of existent infrastructure** to deliver on climate objectives, and future global well-being. Generating evidence and defining indicators for translating adaptation (co-)benefits into financial terms, including business cases and underlying return of investments, is key for moving forward in channeling public funds.
- 3 Strengthen financial resilience against climate risks via risk transfer instruments.** Extreme weather events jeopardize developmental gains when cities have to divert substantial public funds for disaster relief and reconstruction measures. Both traditional insurance as well as innovative risk transfer mechanisms, such as cat bonds, cat swaps or parametric insurance, can protect fiscal budgets by providing rapid payouts for disaster response measures, rehabilitation of critical infrastructure, or for long-term reconstruction efforts, allowing to “build back better”. In 2017, G20 and V20 members jointly launched the InsuResilience Global Partnership for Climate and Disaster Risk Finance and Insurance to scale up cli-

mate and disaster risk financing and insurance solutions for vulnerable countries and people. The Global Risk Financing Facility (GRiF) provides customized support on the ground according to countries’ needs and priorities in this area.

- 4 Improve national and local authorities’ capacities to promote effective policy and regulatory frameworks that drive private investments** in resilient urban infrastructure projects and sustainable business strategies. Thereby, encourage local authorities to tackle the governance gap between national and local level to address remaining market failures for private adaptation finance:

- **Empower cities to act as “change agents” and increase cities’ scope of action.** This includes strengthening their fiscal autonomy and authority to gain access to different funding sources and to impose dedicated types of taxes or to issue bonds.
- **Facilitate access to city creditworthiness initiatives and project preparation facilities,** such as the World Bank Group’s City Resilience Program (CPR) or the C40 Finance Facility (CFF) implemented by the C40 Leadership Group and GIZ, to strengthen public entities’ capacities in accessing public and private financing, developing bankable projects and to scale up their investment on climate. This applies in particular to cities from the Global South, as the majority of them still lack access to external financing sources.

- 5 Support the dialogue on best practices and on new cross-sectoral approaches on the ground at local, national and global scale.** Facilitate scaling up and transfer of promising approaches for financing climate resilient infrastructure systems within the G20 and beyond, building on the *G20 Adaptation Work Program* and related exchange fora.

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