

Enhancing Nationally Determined Contributions through Urban Climate Action




A guide for incorporating urban climate action and human settlement issues into the Nationally Determined Contributions enhancement process.


Supporting Organizations:




This report was produced as part of the project Accelerating climate action through the promotion of Urban Low Emission Development Strategies, or Urban-LEDS for short, implemented by UN-Habitat and ICLEI and funded by the European Commission.

For more information on the Urban-LEDS project;

 www.urban-leds.org

 contact@urban-leds.org

 @ICLEI, @UN-HABITAT



The Urban-LEDS project is funded by the European Union.

Disclaimer: The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Union. The European Commission is not responsible for any use that may be made of the information contained therein.

Enhancing Nationally Determined Contributions through Urban Climate Action

A guide for incorporating urban climate action and human settlement issues into the Nationally Determined Contributions enhancement process.

Enhancing Nationally Determined Contributions (NDCs) through Urban Climate Action

Nairobi, June 2020

All rights reserved ©2020

United Nations Human Settlements Programme (UN-Habitat)
P.O. Box 30030, 00100 Nairobi, Kenya www.unhabitat.org

DISCLAIMER

The designations employed and the presentation of material in this report do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the delimitation of its frontiers or boundaries, or regarding its economic system or degree of development. The views expressed in this publication do not necessarily reflect the views of the United Nations Human Settlements Programme or its Executive Board.

HS Number: HS/048/20E

ACKNOWLEDGEMENTS;

Coordinator:

Marcus Mayr, UN-Habitat, Steven Bland, UN-Habitat

Lead Author:

Anya Plescia-Boyd, UN-Habitat

Contributing Authors:

Steven Bland, UN-Habitat, Pasquale Capizzi, Arup, Sarah Colenbrander, Coalition for Urban Transitions, Petter Lyden, GIZ, Marcus Mayr, UN-Habitat

Expert Contributors:

Maria Gracia Aguilar, C40; Verania Chao, UNDP; Alana Craigen, UNDP; Katharina Davis, UNDP; Felix Doehler, GIZ; Nathalie Doswald, UNEP; Julie Greenwalt, Go Green for Climate; Bernd Hackmann, UNFCCC; Catlyne Haddaoui, Coalition for Urban Transitions; Laura M Hammett, UNDP; Benjamin S. Karmorh Jr, Environmental Protection Agency Liberia; Shea O'Neil, Global Covenant of Mayors for Climate and Energy; Martina Otto, UNEP; Philippe Plaga, GIZ; Lea Ranalder, REN 21; Donovan Storey, Global Green Growth Institute; Asrat Yirgu Senator, NDCP and Environment, Forest & Climate Change Commission of the Federal Democratic Republic of Ethiopia; Prof.Dr.Nicola Tollin, University of Southern Denmark (SDU) and Recycling the City Network (RECNET); Maryke van Standen, ICLEI; James Vener, UNDP; Angela Wagner, UNFCCC

Design and Layout: Euclide Namema, UN-Habitat

Definitions & Terminology:

Human settlements and urban areas: this guide focuses on both urban areas and human settlements and considers these as a city or town of any size where people live and work in close proximity. It recognises that great variation exists between countries in terms of how they define urban areas. The terms “urban areas” and “cities and towns” are used interchangeably, where “Human settlements” is a broader term referring to any cluster of dwellings where people live.

Nature Based Solutions (NBS) use the features and complex system processes of nature, such as its ability to store carbon and regulate water flows, in order to achieve desired outcomes, such as reduced disaster risk and an environment that improves human well-being and socially inclusive green growth.

Sub-national government: This refers to regional, local, state, city, municipal level, or any tier of government below national level.

Urban content: This term broadly encompasses urban-specific references within NDCs – this could range from referring to city-specific climate monitoring or indicators; to addressing the urban sector in a dedicated section of the NDC; to including urban stakeholders in the consultation process. Essentially evidence that urban challenges have been considered and urban measures have been articulated that can be translated into action.

Urban stakeholders: This will vary on a country basis but could be drawn from; city governments and local authorities, utilities, private sector, community organisations (particularly those representing vulnerable groups, such as the urban poor or informal workers).

Urban climate action: this refers to all urban climate actions– whether they focus on mitigation, adaptation, resilience or an integrated approach of all of these.

Vertical Integration & Multilevel governance: These terms are used to describe intentional and strategic linkages and coordination between national and sub-national climate planning, implementation, communication and monitoring and evaluation.

Nationally Determined Contributions (NDCs) embody efforts by each country to reduce national emissions and adapt to the impacts of climate change, collectively aiming at limiting warming to 1.5 to 2°C, as set out in the Paris Agreement.

Conditional/Unconditional contributions to Nationally Determined Contributions (NDCs): An “unconditional contribution” is what countries could implement using domestic resources and capabilities, to contribute towards their NDC targets. A “conditional contribution” is one that would be implemented if international support were provided.

Foreword



As I write this, the current COVID-19 health emergency rightly consumes much of our attention. However, this crisis also clearly demonstrates the importance of accelerating progress towards realising the seventeen ambitious Sustainable Development Goals (SDGs) the world's governments committed to in 2015, and the Paris Climate Change Agreement of the same year.

Had we been further advanced in meeting these goals, we would be better equipped to face this challenge - with stronger health systems, fewer people living in extreme poverty, less gender inequality, a healthier natural environment, and more resilient societies.

In order to accelerate progress, the UN has declared its Decade of Action to accelerate global action in support of Member States goals and aspirations in (i) eradicating poverty and reducing inequality, (ii) driving climate action and supporting a healthy planet, and (iii) achieving gender equality and the empowerment of women and girls.

At UN-Habitat, we believe that the success of this Decade of Action will depend on how rapid urban growth is managed. Already, we live in an urban world: more than 55 % of the world population lives in urban areas today and this number is expected to rise to around 66% in the coming decade.

Human settlements are drivers of economic prosperity and hubs for social and human development. But they also generate a significant share of global Greenhouse gas emissions and are particularly vulnerable to its effects. Some of the communities most vulnerable to climate change are the urban poor. Integrating sustainable urban development into national climate commitments – Nationally Determined Contributions (NDCs) - is therefore of paramount importance.

According to UN-Habitat's analysis of the first round of national pledges submitted under the Paris Agreement, approximately two thirds of all countries have included some urban references in their submitted Nationally Determined Contributions (NDCs), but there remains much still to do.

It is our hope that this guide can inspire governments to go further in integrating urban and human settlement issues into NDCs, and effectively integrate the urban development community in the formulation and implementation process. It was informed by country representatives, partners, and experts in the urban development and climate change community over the course of the past 6 months in a participatory and consultative process.

With our attention focused on responding and recovering from the COVID-19 crises, let us ensure that every action we take today, every investment and support we mobilise, stimulates more sustainable, low-carbon and resilient development pathways that leave no one and no place behind.

UN-Habitat is grateful to its partners for their support in this endeavour, and hopes that it will be a useful contribution to government efforts to improve low-carbon urban development and climate resilience. I would like to encourage planners at the national and sub-national level, experts, and decision-makers working on climate change to use this Guidance to better understand the need and opportunities for climate change adaptation and mitigation in human settlements.

At the same time, I hope that this publication will also be useful for local authorities to contribute to NDC formulation and implementation and rally behind these important shared national commitments, and strengthen synergies and partnerships between all actors.

Ms. Maimunah Mohd Sharif
Under-Secretary-General and
Executive Director, UN-Habitat

PURPOSE OF THIS GUIDE

In the coming months and years, Member States will continue to undertake domestic processes to review, strengthen and implement their Nationally Determined Contributions (NDCs).

Inclusion of urban climate action and subnational government stakeholders in NDC formulation, priority setting, targets, governance and implementation has the potential to support government efforts to enhance ambition and delivery of NDCs.

Similarly, the NDCs can inform urban policies and priority setting. Member States have requested support on how best to integrate human settlement and urban issues into their NDCs¹ and this guide aims to offer this in an applied manner.

The intention of this guide is to support Member States to:

- **Enhance** the ambition of their NDCs in the current 2020 and future revision processes, by harnessing the potential of human settlements and urban climate action to deliver a high quality of life while reducing greenhouse gas (GHG) emissions.
- **Support** a more integrated approach to NDC development and implementation across national and local governments.
- **Implement** their NDCs by aligning the activities of urban stakeholders behind a common vision for human settlements.

- **Embed** their climate objectives into urban decision-making across all sectors of government
- **Create** the enabling frameworks towards the implementation of high-ambition NDCs at sub-national level and help climate authorities to engage with urban authorities through a common basis of language and understanding

Target audience

The guide aims to provide practical and succinct opportunities for incorporating urban climate action and human settlement issues into the current future NDC revision and enhancement process, drawing on existing knowledge and networks.

It is primarily targeted at national governments, specifically NDC coordinators and their teams, but also provides insight for sub-national stakeholders aiming to engage with the NDC process more effectively. We have included some extracts from submitted NDCs and some country case studies, to provide tangible examples.

To effectively integrate human settlements and urban content into the NDC process requires engagement of national stakeholders with urban importance - like ministries of housing and urban development, national utilities like energy, water and waste, housing companies, construction and transport sector – as well as sub-national

stakeholders such as city governments and local and regional governments in order to help achieve an economy-wide approach to addressing the climate challenge. This requires effective collaboration between public and private sector actors.

Who has contributed?

This UN-Habitat guide is a product of collaboration with a wide variety of expert contributors from organisations such as; Arup, the Coalition for Urban Transitions, C40, the Environment, Forest & Climate Change Commission of the Federal Democratic Republic of Ethiopia, the Environmental Protection Agency of Liberia, GIZ, Global Covenant of Mayors for Climate & Energy, Global Green Growth Institute, Go Green for Climate, ICLEI, NDC Partnership,

REN21, UNDP, UNEP, UNFCCC, and the University of Southern Denmark, who are partnering to support Member States to include urban and human settlements related actions in their NDCs.

The Guide was developed as part of the project "Accelerating climate action through the promotion of Urban Low Emission Development Strategies", implemented by UN-Habitat and ICLEI and funded by the European Commission.

How to use this guide

It is recommended that this guide can be used by NDC teams in national government in the following ways. UN-Habitat and its partners can support member states with this work by providing virtual or in-person technical and facilitation support:

Stage of NDC Revision	Activities to make use of the guide
<p>Planning NDC 2020 revision process (e.g. submission prior to COP26)</p> <p>OR</p> <p>In the process of 2020 NDC revision (e.g. submission planned for next 3-6 months)</p>	<ul style="list-style-type: none"> • Use guide to review previous/draft NDC and identify gaps and opportunities • Use guide to review national planning processes (e.g. check alignment with NUPs, existing city plans, financing opportunities etc.) • Plan/implement sectoral workshops with lead Ministries focusing on the urban dimension of sectoral NDC responses • Secure support of an urban specialist to 'champion' issues as part of sectoral working groups • Reach out to international partners (e.g. NDCP members) to support in specific technical areas or facilitation support • Share guide along with schedule of the upcoming NDC process to urban stakeholders at national and local level
<p>Submitted 2020 NDC revision, ongoing implementation (and future revisions)</p> <p>(already submitted NDC to UNFCCC in 2019/20)</p>	<ul style="list-style-type: none"> • Review the submitted NDC and consider opportunities in light of: <ol style="list-style-type: none"> a) NDC implementation plans: identifying urban relevant commitments and actions b) Future NDC revisions: identifying gaps and opportunities • Extend communication of the NDC to urban stakeholders at national and local level

Where we are at with NDCs?

2020 is the first five-year milestone of the 2015 Paris Agreement. In preparation, countries are required to prepare new or updated NDCs as part of the agreement's 'ratcheting mechanism', which requires countries to continue to submit NDCs every five years. NDC enhancement – whether it involves new or updated NDCs – should be pursued in the context of a country's long-term strategies (also due to be submitted in 2020) that will guide countries' transitions to a low-carbon, climate-resilient future by 2050².

The Paris Agreement set out a global commitment to limiting warming to well below 2°C or 1.5°C³. According to the IPCC 2018⁴ Special report, we are currently on track to exceed 1.5°C sometime between 2030 and 2052.

This expected increase of the global mean temperature is associated with rising sea levels, rapidly changing ecosystems and more extreme and slow-onset events such as heat waves, storms and flooding. The impacts undermine global efforts for development and prosperity everywhere.

The expected devastating effects of climate change can only be prevented by more ambitious and more effective climate action where CO₂-emissions must be net-zero in 2050 and efforts to adapt to climate change need to increase significantly.

The UNEP Emissions Gap Report 2019 finds that even if all unconditional Nationally Determined Contributions (NDCs) under the Paris Agreement are implemented, we are still on course for a 3.2°C temperature rise. Parties to the Paris Agreement need to go beyond current commitments and dramatically strengthen their NDCs in 2020.

There is a rapidly closing window of opportunity if we are to achieve the objectives and long-term goals of the Paris Agreement⁵ and current commitments are not enough. Countries must increase their NDC ambitions threefold to achieve the well below 2°C goal and more than fivefold to achieve the 1.5°C goal⁶.

The landscape has changed since the 2015 Paris Agreement. To date 187 countries have ratified or otherwise joined the Paris Agreement representing 97% of global emissions⁷; technical innovation has resulted in the price of renewables and a wide range of low carbon measures falling; countries have started focusing on decoupling emissions from economic growth⁸; and there is a growing public appetite for ambitious climate action, particularly from youth. Extreme weather events of 2019 and the global pandemic of 2020 are bringing the importance of adaptation and resilience of nations and cities to the forefront of the political agenda.

Increasing ambition through stronger GHG reduction targets and adaptation efforts are some of the key goals of the NDC enhancement mechanism built into the Paris Agreement. There are many ways to commit to and deliver greater emission reductions, including activating the potential action by local governments, expanding or 'deep diving' into sectors, greater transparency, attracting climate finance and investment, as well as increasing implementation and building broader buy-in from key ministries and stakeholders⁹.

2 While NDCs operate on five-year cycles and currently extend roughly through 2025 or 2030, long term strategies involve planning to mid-century, these two different planning tools are closely related. See more: www.wri.org/news/climate-action-today-and-tomorrow-relationship-between-ndcs-and-ltss

3 Rogelj et al., 2016

4 IPCC, 2018

5 Rockstrom et al. 2017

6 IPCC 2018

7 <https://www.wri.org/faqs-about-how-paris-agreement-enters-force>

8 WRI, 2017

9 WRI & UNDP, 2019a

UNFCCC Guidance on NDCs in relation to urban climate action and sub-national stakeholders:

The 'Paris rule-book' also known as the Katowice Climate Package – is a set of decisions from Katowice COP24 – by the CMA¹⁰, which include (amongst other things) guidance on inclusions in NDCs.

The Paris Rulebook reaffirms the key role that a broad range of stakeholders, including, **regions, cities**, the private sector, intergovernmental organisations, non-governmental organisations, decision makers, scientists, youth, women and indigenous peoples, play in ensuring Action for Climate Empowerment¹¹. And further encourages public participation and engagement with local communities and indigenous peoples, in a gender-responsive manner.

It also outlines that specific projects, that may contribute to mitigation or adaptation and/or economic diversification should be included in the NDC, which may cover, but are not limited to, key sectors, such as energy, resources, water resources, coastal resources, **human settlements and urban planning**, agriculture and forestry; and economic diversification actions, which may cover, but are not limited to, sectors such as manufacturing and industry, energy and mining, transport and communication, construction, tourism, real estate, agriculture and fisheries¹².

Urban content in NDCs

A study undertaken by UN-Habitat in 2017 showed that the majority of NDCs, 113 out of 164, show strong or moderate urban content, with the main portion focusing on urban issues in the context of adaptation (see Figure 1). Only around 20 countries have NDCs that speak to climate mitigation in urban areas¹³. Surprisingly, some of the most urbanised countries have little explicit urban content in the NDCs.

This represents an enormous missed opportunity that can be addressed in the current round of NDC updates by 2020, as some of the 'low-hanging fruit' in terms of climate action clearly exist in cities.

Including the needs and potential of urban areas and human settlements in NDCs presents an opportunity to address issues of implementation

by incorporating multi-sectoral stakeholders and actors from all levels of government and the economy in decision-making, attracting finance, and achieving both mitigation and adaptation objectives set at a national level. Periodic NDC revisions provide the platform to incorporate new technology innovations and send investment messages to the private sector.

The Global NDC Outlook Report (2019) highlighted that there was still a substantial need for countries to mainstream their NDC into sub-national policies and budgets. Whilst almost all 133 countries stated that they have, or are in the process of mainstreaming their NDC targets (integrating them into national climate change policies, strategies, budgets and laws) there has been little progress on ensuring that NDCs are parts of budgets, especially at regional levels, or in regional development planning. (See Figure 2)

10 CMA is the short form for the group of the countries who have signed and ratified the Paris Agreement. The full name of this governing body is "Conference of the Parties serving as the meeting of the Parties to the Paris Agreement"

11 UNFCCC, 2018a (FCCC/PA/CMA/2018/3/Add.2)

12 UNFCCC, 2018b, (FCCC/PA/CMA/2018/3/Add.1)

13 CUT, 2019; UNH 2017: Both analyses based on a database of 160 NDCs developed by UN-Habitat and the University of Southern Denmark

Urban content of NDCs

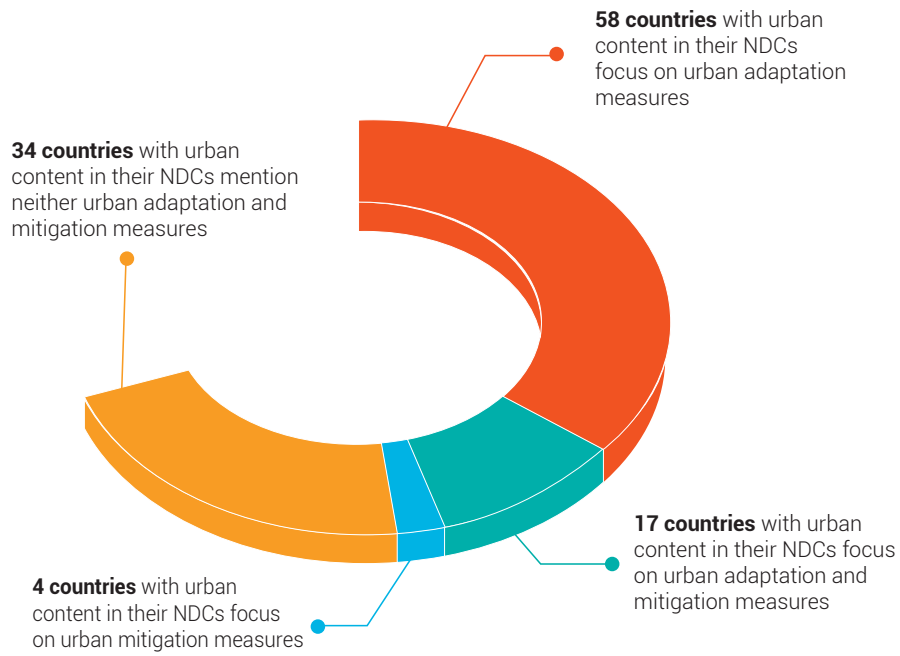


Figure 1: Analysis of urban content in NDCs from UN-Habitat (2017)

Mainstreaming of NDC targets into Sub-national plans and budgets

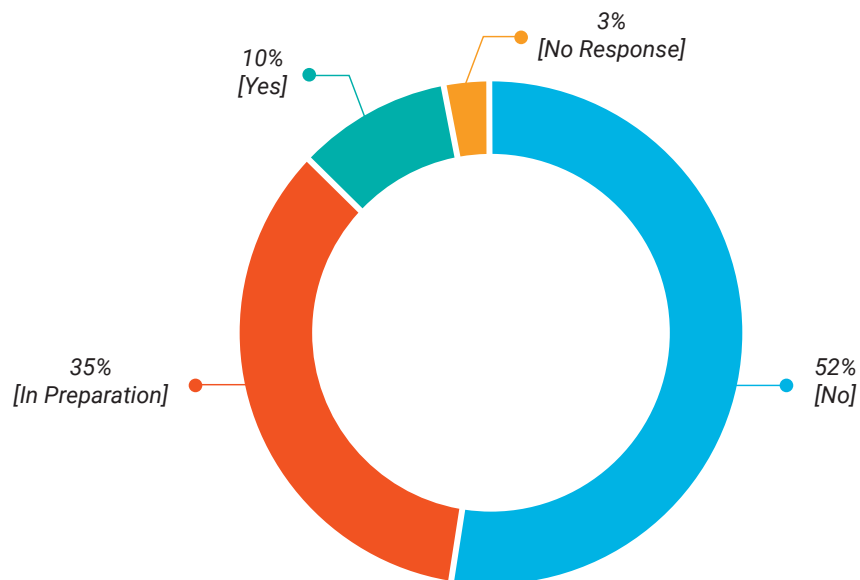


Figure 2: Based on data from the NDC Global Outlook Report 2019 (UNDP 2019)

This suggests that governments have not yet considered how to fund a long-term shift to net-zero carbon and have not sufficiently engaged sub-national actors¹⁴.



The busy city of Yangon, Myanmar with a lot of vehicles and activities on the street ©Shutterstock

MAKING THE CASE FOR URBAN CLIMATE ACTION

Why should national governments include urban content in their NDCs?

Cities in almost every country are growing rapidly, and urban areas hold the key to successful national emission reduction and development of adaptive capacities. Currently 4.2 billion (55%) of the world's population lives in urban settlements^{15,16}, this number is expected to increase to 6.7 billion by 2050 (68% of the population)¹⁷.

Urban citizens are increasingly vulnerable to multiple climate change risks and these risks are especially critical for the urban poor and marginalised populations¹⁸.

The urban and infrastructure sector was listed in the IPCC Special Report (2018), as one of the key sectors where an urgent transition is needed along with energy, land use and industry. The report states 'urban and infrastructure system transition consistent with limiting global warming to 1.5°C ...would imply, for example, changes in land and urban planning practices, as well as deeper emissions reductions in transport and buildings'. It has however been shown that it is possible to reduce greenhouse gas emissions from urban buildings, materials, transport and waste by almost 90% by 2050 using technically feasible, widely available mitigation measures (see Figure 2)²¹.

"Since urban areas are the source of around 70% of global emissions, city emissions reductions can contribute greatly to Nationally Determined Contributions (NDCs). It is in national interests to ensure that cities are supported to establish 2050 targets that are compatible with the Paris Agreement goals. Nations have a responsibility to help unlock city action and financing pathways, both to bolster NDCs and advance global progress towards the Paris Agreement goals¹⁹. Cities are also especially vulnerable to the impacts of climate change. Groundwater depletion, fires, food shortages, sea-level rise, extreme temperatures and increased frequency of extreme weather events such as floods, droughts and storms which affect city infrastructure and the livelihoods and health of residents²⁰.

15 UNDESA, 2019

16 For comparison in 1950, 30 % of the world's population was urban, and by 2050 it is projected to be 68 %

17 UNDESA, 2019

18 Kapos, 2019

19 GCoM, 2019

20 REN 21, 2019

21 CUT, 2019

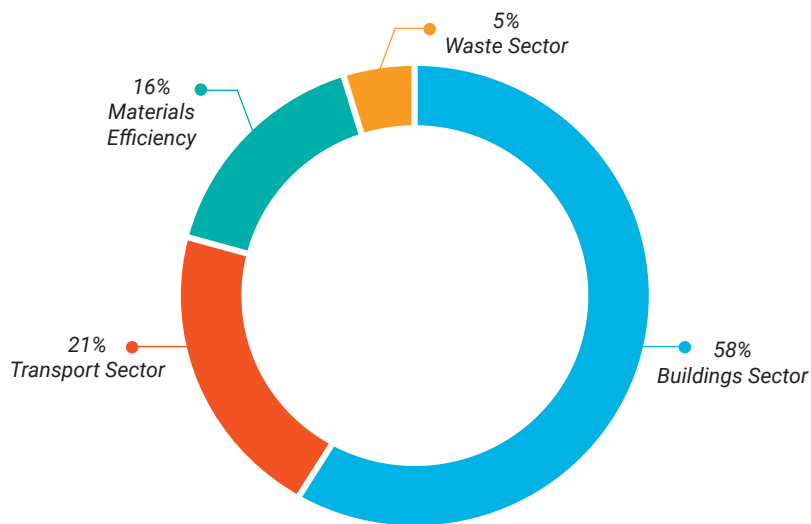


Figure 3: Sectoral breakdown of technically feasible and available mitigation measures to achieve 90% reduction in GHG (based on CUT 2019 figures)

For example, if the urban water sector were to become carbon neutral, it could contribute the equivalent of 20% of the sum of committed reductions by all countries in the Paris Agreement²². For regions with sufficient rainfall, green infrastructures and urban vegetation can reduce urban heat island effects and thus lower needs for cooling and energy²³.

Such a low-carbon urban transition will need big investments, and quickly, but they are very productive, attractive investments, and by empowering local governments and enabling (and accounting for) urban climate action, can offer cost-effective means to achieve national emission targets. By considering sectoral targets and actions through an 'urban lens' also ensures great policy coherence and alignment and leverages greater opportunity for mitigation and adaptation potential.

National and governments therefore have a huge opportunity to further reduce their emissions and to secure international recognition for their climate leadership (at national and sub-national level) and support for their climate actions by including more urban content in their NDCs.

At the same time, these commitments offer a chance for national governments to advance their domestic agenda and sub-national governments to deliver local climate action, collectively resulting in more resilient, healthier, more liveable and more productive cities and thereby stimulate national socio-economic development.

Climate change impacts on urban areas are increasing. Key issues include rising temperatures, heat stress, water security and pollution, sea-level rise and storm surges, extreme weather events, heavy rainfall and strong winds, inland flooding, food insecurity, and ground water salination.

A significant portion of the world's urban areas are located along coastlines, where rising sea levels and storms threaten inhabitants and infrastructure with flooding and strong winds²⁴. Cities in low-elevation coastal zones, for instance, face the combined threat of sea-level rise and storm surges. Often industrial centres are located on estuaries and close to urban areas and ports.

The specific impacts on each city will depend on the actual changes in climate experienced (for example, higher temperatures or increased rainfall), which will vary from place to place²⁵. Effective climate adaptation is possible, but it requires risk-reducing infrastructure, effective institutions, the capacity to learn from past events, and finance, which is lacking in many towns and cities.

This means there will probably be considerable residual loss and damage, arising from the climate change impacts that cities cannot cope with or adapt to. At present, the extent of this loss and damage is difficult to quantify, and nobody really knows what policy changes are needed to address this at local and national scales²⁶.

22 Ballard, S et al (2018)

23 The Urban Land Trust (2016)

24 REN21, 2019

25 World Bank, 2011

26 <https://www.iied.org/climate-related-loss-damage-cities-exploring-new-urban-frontier>



A significant portion of the world's urban areas are located along coastlines, where rising sea levels and storms threaten inhabitants and infrastructure with flooding and strong winds.

Cities are vital economic and financial centres, accounting for more than 80% of global GDP²⁷. Poorly managed cities exacerbate enormous new demands for energy and infrastructure investment. A growing number of cities are joining various non-state actor partnerships, to become more efficient, sustainable and low emitting²⁸.

This provides an opportunity to strengthen their voice, increase advocacy capacity, share learning and inspire other cities to act. Some cities have even committed to climate action that is more ambitious than the targets of their national governments and can encourage national officials to commit to more ambitious climate action.

Policy momentum across various levels of government, as well as a surge in climate action commitments by non-state actors, is creating opportunities for countries to enhance the ambition of their NDCs²⁹. At the subnational level, for example, over 70 large cities housing 425 million people have committed to go carbon-neutral by 2050 or sooner³⁰.

Including urban content and human settlements in NDCs presents an opportunity to enhance ambition and implementation through strengthening collaboration across all levels of government and engaging with multi-sectoral stakeholders in decision making to achieve both mitigation and adaptation objectives.

Articulating urban climate action as a national priority within the NDC is necessary for attracting financing and leveraging political commitment. The NDC revision process provides the platform to incorporate new technology innovations and send investment messages to the private sector. If adding new- in this case urban climate - policies and actions that result in lower cumulative emissions than the combined impact of targets, policies, and actions under the existing NDC, they enhance ambition³¹.

We have a possibility here to boost urban-rural resource efficiency to support resilient, sustainable development and build on cities' ambitious climate and resilience plans. It consolidates the commitment of national governments to achieving the Sustainable Development Goals – in particular SDG 11 **'make cities and human settlements inclusive, safe, resilient and sustainable'**.

There is an opportunity to enhance policy coherence, governance and financing across different levels of government and thus reduce the risk of maladaptation. Ultimately no country would be able to deliver the Paris targets without action from the subnational level, especially in highly urbanised countries. As UN Secretary-General António Guterres said, cities are where the climate battle will largely be won or lost³².

27 REN 21, 2019

28, 29, 30, 31 UNEP, 2019

How can national governments support urban climate action to deliver on their NDCs?

Including urban content in the NDCs can strengthen the role of local and sub-national governments in the delivery and implementation of NDC commitments. One shortcoming of current NDCs is that they are difficult for many sub-national actors to translate into concrete action.

NDCs are just one proxy for national policy alignment on cities and climate change, let alone policy implementation. Several countries have longstanding commitments to urban climate action that are not captured in their NDCs. Many more countries have urban-relevant pledges in their NDCs, promising to reduce emissions from buildings, electricity generation, transport and waste.

These sector-based commitments are welcome, and reflect the reality that policies are crafted and budgets allocated through sectoral line ministries.

It is therefore important to understand how an urban lens in addition to a sectoral lens can drive further emission reductions. A purely sectoral approach to climate change mitigation will miss the full urban opportunity in two key ways:

- An urban **spatial approach** allows national governments to realise the mitigation and adaptation potential associated with integrated urban systems. A sectoral focus on transport, for example, offers opportunities to 'avoid' (the need for

motorised travel and travel length), 'shift' (from most energy-intensive and polluting modes of transport towards e.g walking and cycling) and 'improve' (fuel efficiency and integrating renewables into transport)³³.

However, a focus on cities can foster approaches that are more cross-cutting, integrating several end-use sectors by e.g reducing the absolute number of vehicles on the road or the average length of trips by, for example, promoting mixed use and compact urban growth, strengthening alternative low-emission transit options, or invest in urban resilience safeguarding people, economies and infrastructure alike.

This is a more cost- and carbon-effective solution. Pursuing compact, connected and clean cities also offers a huge opportunity for national governments to achieve faster, fairer economic development³⁴.

Compact development improves the feasibility of many low-carbon innovations, such as mass transit, bike sharing and district heating. However, caution should be taken when focusing on densification, as if applied without proper attention to urban design it can, for example, lead to increased urban heat island effect and lower flood resilience capability.



National, and sub-national governments have unique and crucial roles to play in supporting national efforts towards zero-carbon, climate-resilient cities.

32 11th October 2019, <https://unfccc.int/news/guterres-cities-are-where-the-climate-battle-will-largely-be-won-or-lost>

33 Bongardt, D. et al., (2019)



Engaging cities as centres of innovation and education/culture and are often already leading the way in terms of climate action, is a valuable asset for national governments.

Therefore, taking a spatial and urban design perspective can provide a balanced overview considering both mitigation and adaptation priorities in relevant urban or human settlement contexts.

- A multi-level or **vertically integrated approach** allows national governments to realise the mitigation potential associated with local innovation and experimentation. Cities can provide an appropriate scale to pilot low-carbon innovations, including new technologies, policies and business models. (See Figure 4 Multilevel Governance Diagram)

National governments should enable climate action by local governments and support them in experimenting with different technological combinations, regulatory frameworks and business models, and then replicate successful approaches nationwide.

Through continuous dialogue with sub-national actors and encouraging sub-national action in NDCs, national governments can empower and activate local governments to pursue more ambitious climate action within their jurisdictions, offer lessons for the whole country and provide evidence for the development of climate-relevant policies.

The simultaneous rise of networked renewables, smart metering and electric vehicles, for instance, is reshaping energy and transport systems, systems that can be tested and rolled out in cities and build their resilience. Carbon pricing

can be effective but be politically and technically complex. For adequate and impactful NDCs and related climate action, enabling environments for cities and local governments have to be put in place.

Even the largest and most able city governments can deliver only a fraction of their mitigation potential unilaterally, and with over half of all urban abatement potential in cities with populations of less than 750,000 (as of 2015), these cities often lack the financial and technical resources of their larger counterparts³⁵.

At the same time, local and regional governments have a unique knowledge over their territories and of the climate challenges affecting them – essential information for the design of tailored and effective national policies. Engaging cities as centres of innovation and education/culture and are often already leading the way in terms of climate action, is a valuable asset for national governments.

Indeed, national, and sub-national governments have unique and crucial roles to play in supporting national efforts towards zero-carbon, climate-resilient cities. Many national and state policies are explicitly urban-focused, such as the design of spatial planning guidelines, building codes and the drawing of municipal boundaries.

Many more, though not urban-specific, hugely influence the performance of cities, such as national energy planning, tax and transport policies. In addition, funding and financing mobilised by national and state governments is crucial for cities, particularly for large infrastructure projects.

The future of cities and of how climate change is tackled therefore depend substantially on decisions made, by national, and sub-national governments and the enabling environments (political; financial; technical; legal) that support integrated action at and between these levels to deliver on their respective mandate

It is therefore urgent that national governments recognise the urban opportunity and include

more ambitious urban content in their NDCs through a structured dialogue with local and regional governments and other local stakeholders.

At the same time, it is urgent that local governments recognise the national commitment made through NDCs and align their local investments and actions towards these shared national goals.

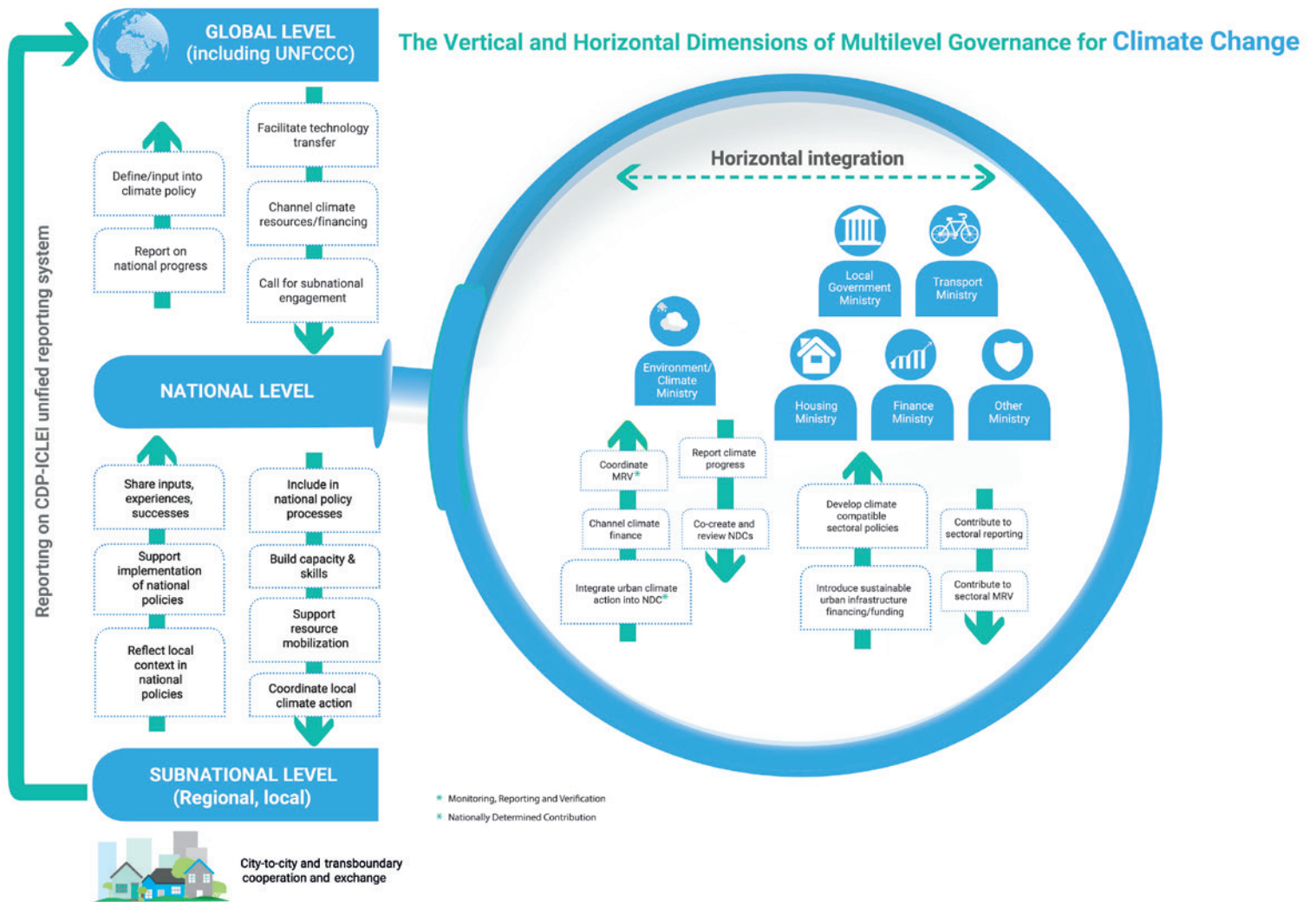


Figure 4: The diagram above attempts to characterise some of the main components of effective multi-level governance for climate action, which includes both vertical and horizontal integration. It was developed by the Urban-LEDS project.

KEY URBAN OPPORTUNITIES WHEN DEVELOPING NDCs

Each country NDC process differs. Some are in-country led processes with broader stakeholder participation, others may be based on smaller internal processes, drawing on external capacity where necessary.

Two main opportunities have been identified for NDC coordinators, in order to integrate human settlement and urban actions into NDCs. The first focuses on the process and the second on the content, of the NDC revision process:

- **Key Opportunity #A:** Engage a diverse range of urban stakeholders in NDC planning.
- **Key Opportunity #B:** Identify concrete policies and actions for integrating human settlements in the NDC, by applying an urban lens.

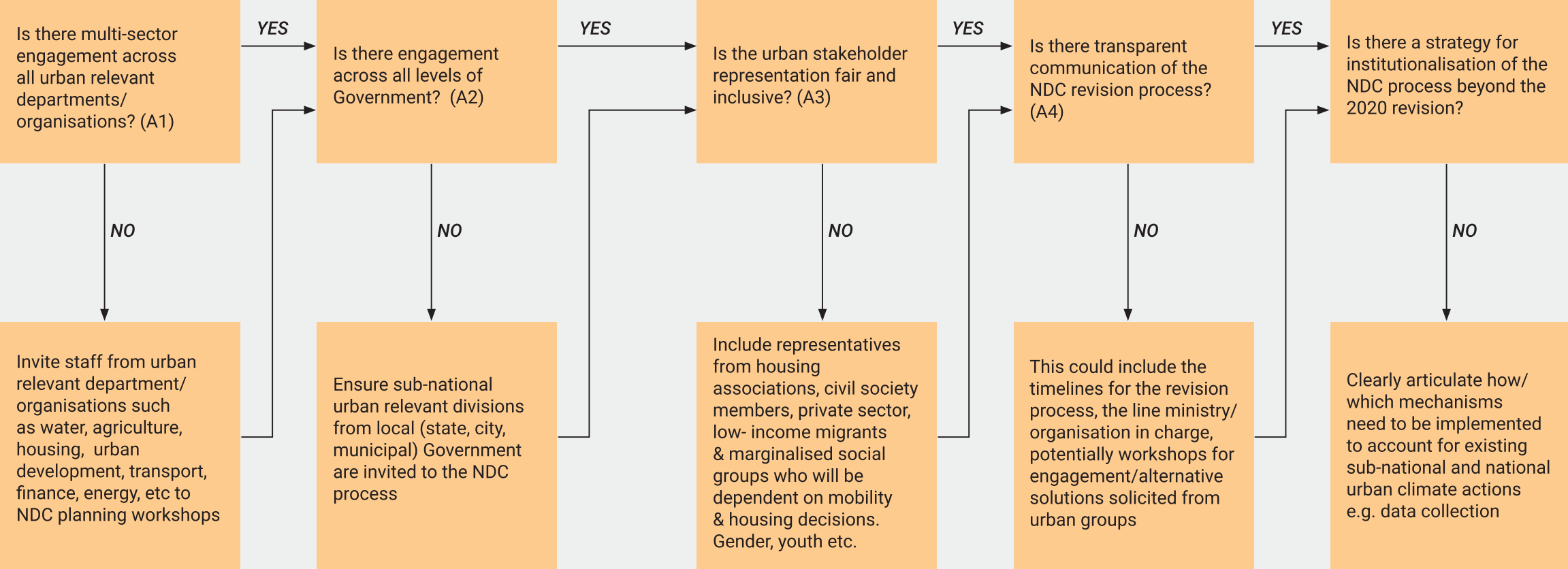


Rajkot, India, and Urban-LEDS project city, has installed a 145kWp solar PV system to help power its Aji water treatment plant

Checklist for integrating urban climate actions into NDCs

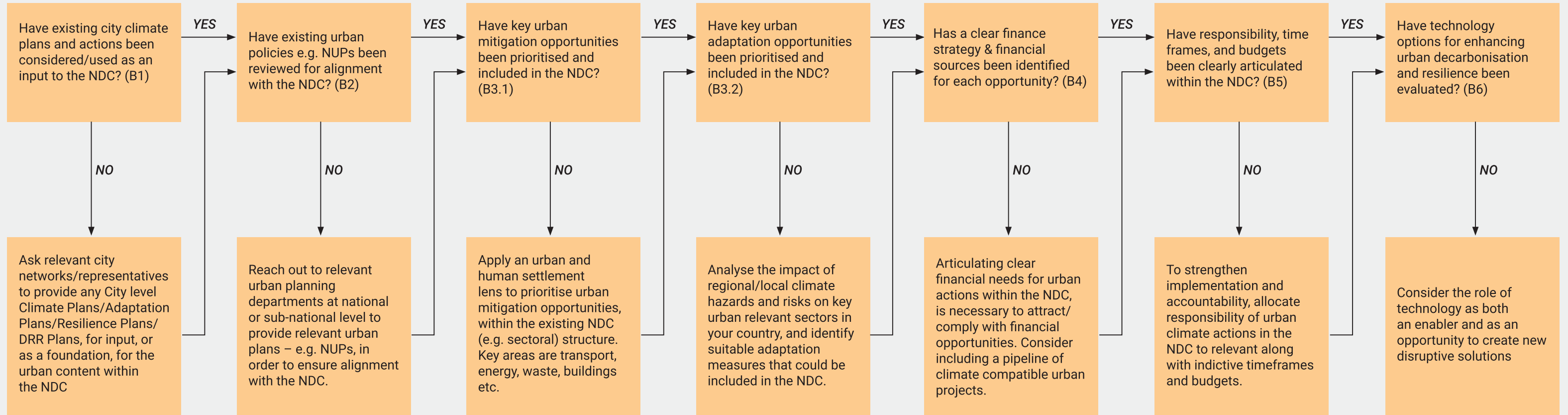
Key Opportunity #A: Engage a diverse range of urban stakeholders in NDC planning

In the process of the NDC revision:



Key Opportunity #B: Identify concrete policies and actions for integrating human settlements in the NDC, by applying an urban lens.

In the content of the NDC revision:



Key Opportunity #A: Engage a diverse range of urban stakeholders in NDC planning

Key Opportunity #A Engage a diverse range of urban stakeholders in NDC planning by :

Sub-opportunities:

- A1. Engage across sectors of all urban-relevant departments/organisations
- A2. Engage across all levels of government (national, subnational and local)
- A3. Ensure fair and inclusive urban stakeholder representation
- A4. Communicate the NDC revision process in a transparent manner
- A5. Institutionalise the NDC process beyond this 2020 revision

A1. Engage across all urban-relevant departments/organisations

Effective urban climate action needs commitment across all urban relevant sectors including water, housing, transport, finance, energy, etc. to including urban measures in the NDC depends on decisions additional to national climate and environment departments.

Shifts from road to rail, or increased mass transit requires leadership from national transport ministries; national housing ministries can incentivise energy efficiency and improved resilience of buildings.

Re-directing national regulations and budgets toward low-carbon infrastructure solutions depends on decisions made within

e.g. the Ministry of Finance³⁶ or Ministry of Infrastructure. Having multi-sector representation in the development of NDCs is the foundation to ensuring the inclusion of long-term urban climate actions, and activation of economy-wide potentials.

What this looks like in practise will vary, it might involve regular convening of ministries at the national level or working group of civil servants supporting the NDC development.

Chile's Updated NDC³⁷: Regarding the reduction of emissions, the application of policies and measures for an effective and permanent reduction of GHG emissions in Chile over time will require a multi-sectoral effort.

35 CUT, 2019

36 These are just examples, each country will have different institutional arrangements and ministries



Clear frameworks to govern fiscal transfers, revenue collection and spending across ties of government can empower local authorities to act on climate...

Whilst the Paris Agreement was developed at a global level through national governments, state and local governments, utilities and the private sector are key implementers of climate policies, it is therefore essential that their representatives are integrated into development of the NDC process in a structured and continuous manner.

A2. Engage across all levels of government (national, sub-national and local)

Governance structures and regulatory powers will vary at national, regional, state or local level. Therefore, they will hold quite different convening powers as well as financial and technological capabilities.

State and local governments need the authority and capacity to control a range of own-source revenues. Responsible fiscal decentralisation can enhance their accountability for local service delivery and underpins their creditworthiness in order to access capital markets³⁸.

National level enabling policies and in many cases decisions around public sector expenditure, plays a key role in urban climate action -firstly, allocating larger portions of ministerial budgets to sustainable urban infrastructure and secondly, creating the enabling environment for local government to implement climate action.

In the context of NDCs it is essential to facilitate engagement from all levels and sectors of government, in order to identify those opportunities appropriate for national government (e.g. road to rail programmes) or sub-national (residential solar water heaters) and allocate financial autonomy accordingly.

The NDC Partnership is frequently requested to support coordination between different levels of government in an effort to mainstream climate action at the local level. They have identified ways of engaging sub-national governments to include:

- Multi-stakeholder consultation at the local level,
- The use of local climate plans to inspire national actions,
- Support to local implementation and finance³⁹.

National and regional governments tend to have primary authority or influence over two thirds of this urban abatement potential. National and state governments have primary authority over 35% of urban abatement potential, while local governments have primary authority over 28%. For the rest, collaborative climate action is needed across different tiers of government⁴⁰.

As outlined in the Climate Emergency, Urban Opportunity Report⁴¹ "National governments can codify the roles, rights (and duties) of subnational governments in law. It is particularly important to clarify the revenue streams available to municipal governments, and the conditions under which they can use debt financing.

Clear frameworks to govern fiscal transfers, revenue collection and spending across ties of government can empower local authorities to act on climate change, give confidence to investors and lenders looking to finance sustainable urban infrastructure and offer security to national governments that are ultimately liable for subnational debts".

37 Government of Chile, 2020

38 CUT, 2019

39 NDCP, 2020a

40 CUT, 2019

Case Study Box 1:

Kenya's 'Whole of Government Approach'.

In 2016, Kenya became one of the first African countries to pass climate change legislation in the form of the Climate Change Act. Leaders understood that in order to succeed in boosting climate resilience and reducing greenhouse gas emissions, they would need all hands on deck. They call it a “whole-of-government approach,” and climate change units were created in every governmental ministry, state agency and county government. The Kenyan government seeks to integrate climate change at the national and sub-national levels, including a high-level climate change council, which reports to the president (GIZ Country Case Study).

A3. Ensure fair and inclusive urban stakeholder representation

Urban stakeholders outside of government should also be invited to participate and advise on the most effective measures to include in the NDC. It's important to be inclusive in the stakeholder process and bring in representatives from all walks of urban life, housing associations, infrastructure and services, different civil society groups, businesses and institutions.

Also assessing how the different needs, opportunities and impacts of urban climate change on men and women and youth have to be considered in the NDC⁴². Gender differentiated impacts are clearly visible in urban and human settlements, particularly in key climate sectors, such as access to energy (costs of electricity connection and public lighting), transport, water management, waste management, etc.

We should not assume that all persons in a household have the same resources (for example ability to access finance to purchase clean stoves in the energy sector or to avail of tax incentives for electric cars; or subsidies to build flood barrages for resilience; or control over land to be able to changing farming practices).

Women and men may have different constraints, risk, opportunities, and decision-making power, therefore the need for gender responsive measures are required.^{43,44}

Who are 'Urban Stakeholders'?:

This will vary on a country basis but could be drawn from; city governments and local authorities, utilities, private sector (e.g. property developers), community organisations (particularly those representing vulnerable groups, such as the urban poor or informal workers). Private sector and public private collaborations within and around urban areas (e.g. insurance companies, designers, informal vendors, manufacturers) are key to ensuring long term investment in e.g. renewable energy, e-mobility, energy efficient buildings.

One role for local government can be to adequately reflect and channel inputs from such a diverse group of stakeholders to national decision-making bodies. Another idea could be to organise regional NDC workshops and convening dedicated urban working groups to enable this.

41 CUT, 2019

42 UNDP, 2019b

43 UNDP, 2019b

We have already seen different countries shape engagement processes that suit the governance and institutional arrangements that underpin the

development of their climate policies and NDC development.

Case Study Box 2

Inclusive stakeholder processes in Chile:

Chile has introduced two innovative solutions to coordinate subnational action to adapt to climate change: Regional Committees on Climate Change (CORECCs for their acronym in Spanish) and regional GHG inventories. The CORECCs have been developed in the context of Chile's National Action Plan on Climate Change 2017-2022. They are chaired by the regional governor and involve public entities (regional representatives of ministries, regional councils, and municipalities) as well as businesses, citizens, NGOs and academia. To this date (May 2018), 14 out of 15 regions in Chile have already established a CORECC. It is expected that the committees will play a key role in building a bridge between a climate change perspective and regional development plans, regional climate finance and local implementation⁴⁵.

Norway's Second NDC⁴⁶: In 2018 Norway held two Talanoa Dialogues⁴⁷. One between the Minister for Climate and Environment and mayors (municipalities) and one initiated by Norwegian environmental organisations and the Parliament.

A4. Communicate the NDC revision process in a transparent manner

The NDC revision and submission process is country-driven and governed by the UNFCCC framework, and therefore in reality each country will be facilitating their domestic process slightly differently. Whether driven by a national government department or dedicated national/international expert, the NDC process should be communicated somewhere.

This could include the timelines for the revision process, the line ministry/organisation in charge and contact details, potential workshops for engagement – or if there are no specific engagement opportunities, then alternatives for submitting recommendations or opinions actively solicited from urban groups.

Convening urban-focused workshops can enhance ambition and enable collaboration. Ensuring communication around the NDC revision process will support transparency, participation and broader buy in.

44 See further more detailed studies on the role of gender in NDC development in UNDP 2019b and UNDP 2016

45 GIZ, 2018a

46 Government of Norway, 2020

Case Study Box 3:**Communications in the Peruvian NDC:**

Peru set up an ambitious whole-of-society process called Dialoguemos NDC (“let’s talk about the NDCs”). After a successful first phase of national consultations, a second one has been launched at the local level. This process should inform the government in its NDC enhancement process. As of late July 2019, local consultations had been organised in the regions of Junín, Ucayalí, Arequipa and Peruvian Amazon. Peru as a following step after the Dialoguemos programme, Peru has requested support in establishing agreements with local governments on NDC implementation.

These will aim at identifying financial resources for implementation. Following the communication strategy prepared early on in the process, several actions in this regard were adopted, such as: Formation of the Multi-Sectoral Communications Team (Grupo de Trabajo Multisectorial, GTM); Creation of the GTM-NDC newsletter with press releases and other communication materials, photographs and videos; Setting up of a NDC website; Carrying out a national study on perceptions of climate change by citizens, to be used as baseline for strengthening the sectoral communications regarding the NDC⁴⁸.

A5. Institutionalise the NDC process beyond 2020

The NDC revision process is due every 5 years and therefore a clear policy space needs to be carved out for articulating how this will be achieved across all levels and sectors of government at a country level. Institutionalisation of the process is necessary to provide a framework for continuously developing urban mitigation and adaptation opportunities and developing strategies for implementing sustainable urban infrastructure.

Mechanisms need to be implemented to account for existing sub-national and national urban climate actions, and ensure they add up to long-term climate objectives. Policy continuity is also important to influence long term urban investment plans.

Often the implementation of data collection and Monitoring, Reporting and Verification (MRV) (in the context of the transparency frameworks under the UNFCCC) falls on sub-

national government. Coordinated discussions are needed between city and national levels to ensure data collection and indicators are aligned and realistic.

Moldova’s Updated NDC⁴⁹: Identify monitoring indicators, including gender-disaggregated ones, to monitor the implementation of adaptation actions at the community/city level.

When planning urban climate action within the NDC, it is necessary to consider how to link data collection from urban areas through sub-national government to the national level in the long term, to demonstrate contribution towards NDC targets. Many cities have already developed a GHG inventory or resilience tracking tools, however harmonising and standardising data collection is still not consistent, which makes aggregation at a national level challenging – although it is possible.

47 These are inclusive, participatory and transparent dialogues and articulated in Paris Decision 1/CP.21

48 GIZ, 2018b

Case Study Box 4:

Integrating data systems in Indonesia⁵⁰:

The Sign-SMART database is used to collate the National GHG Inventory, and is a simplification of the widely accessible IPCC 2006 method. The system assists in facilitating coordination of the relevant ministries and agencies. Through this web-based system, data on the activities of relevant agencies, including from the sub-national levels, can be delivered to the Ministry of Environment and Forestry. It combines a top-down approach (using national aggregated data with national ministries/institutions involvement) with bottom-up data (using sub-national aggregated data with involvement of local government units (LGUs)). Indonesia is also piloting the Global Protocol for Community-Scale Greenhouse Gas Emission Inventories (GPC) which was jointly developed by ICLEI, the World Resources Institute and C40.

When used by cities, it allows consistency making comparisons between cities more accurate, and makes it possible to aggregate local, sub-national, and national government GHG emissions data to allow for more credible and meaningful reporting.

Furthermore, the GPC provides methodology to estimate city-induced emissions comprising both direct and indirect emissions resulting from activities within the city boundaries. GPC is a consumption based GHG inventory which accommodates transboundary emissions. Under the Urban-LEDS II project a collaboration is underway with the national government of Indonesia to harmonise these two reporting frameworks to further enhance the national-reporting framework of Indonesia and align it with global reporting frameworks.

It is also necessary to build capacity of local government to engage in the NDC process and to implement the targeted actions and reporting outlined within it.

Update NDC Chile⁵¹: In 2020, Chile will develop a 'Strategy for "Capacity Development and Climate Empowerment" and will begin its implementation in 2021, with the aim of strengthening the sectoral, national and subnational capacities of citizens and organisations (public and private, from academia and civil society), to achieve national mitigation and adaptation targets.

Lao PDR 1st NDC⁵²: "Capacity building on Sustainable and integrated urban planning for the implementation of transport focused NAMAs".

49 Government of the Republic of Moldova, 2020

50 ICLEI Southeast Asia Secretariat

51 Government of Chile, 2020

52 Government of the Lao People's Democratic Republic, 2015

Key Opportunity #B: Identify concrete policies and actions for integrating human settlements in the NDC

Key Opportunity #B: Identify concrete policies and actions for integrating human settlements in the NDC by:

Sub-opportunities:

- B1. Build on existing city climate and resilience plans and actions that are already contributing to NDC targets
- B2. Assess alignment with existing urban policy
- B3. Prioritize key urban climate opportunities
 - B3.1 Key Mitigation opportunities
 - B3.2 Key Adaptation opportunities
- B4. Outline a clear finance strategy for each urban mitigation and adaptation opportunity
- B5. Allocate responsibility, time frames, monitoring frameworks and budgets
- B6. Evaluate technology options that may enhance decarbonisation and resilience of urban environment

A key starting point is to review the initial NDC, and identify whether urban climate actions have been included, and if so, can they be strengthened?

If there is no specific reference to urban mitigation or adaptation, consider which relevant sectors referred to in the NDC, have specific urban relevance (e.g. transport, buildings, infrastructure, land use planning) which could be enhanced to include more ambitious urban climate priorities and actions.

Consider opportunities for urban climate action in an integrated manner that could reap both mitigation and adaptation benefits.

B1. Build on existing city climate and resilience plans and actions that are already contributing to NDC targets

Cities play a critical role in the achievement of climate actions and many cities are already contributing to NDC targets. Most probably, each country can identify cities that have outstanding leadership and results to drive ambition and implementation of climate action.

Almost 10,000 cities and local governments have set emissions reduction targets as well as a strategy on how to deliver on their commitments, a repository can be found here (Global Covenant

of Mayors⁵³, Non-State Actor Zone for Climate Action Climate Action⁵⁴ and Carbon Disclosure Project 'A Cities'⁵⁵). These cities provide motivation, reference and experiences for national peers and national context specific suggestions on how to scale up action.

It is important to ensure city level actions are being captured in the NDCs (in terms of

accounting, transparency, and recognition) to demonstrate any progress towards national targets. Looking to actions occurring at city level highlights opportunities for replication and scaling up. These experiences are indeed particularly relevant not only in the definition of NDCs but also in the subsequent design of evidence-based national policies to spur climate action.

Case Study Box 5:

Building on local action in the Dominican Republic:

As part of its NDC update process, the Dominican Republic is looking for detailed information on local climate actions currently being implemented by subnational governments and non-state actors. This will allow the country to monitor progress and enable increased ambition in national targets. The Dominican Republic is also planning to establish sub-government structures and bodies to set local targets and oversee NDC implementation⁵⁶.

Japan's 1st NDC: "Promotion of activities based on action plans of local governments".

B2. Assess alignment with existing urban policy

In determining new policies and actions to enhance NDC ambition, it is important to consider whether the new policies overlap with existing policies and targets, as the extent of such overlap would limit ambition⁵⁷.

Whilst national climate strategies tend to be considered in the development of NDCs, there are many urban-relevant policies.

For those countries that do not mention urban issues in their NDCs, this doesn't mean that they do not have policies in place or do not address this issue.

Aligning a national NDC target with sectoral urban-relevant strategies or policies (e.g. transport master plan, building codes) provide an opportunity to mutually reinforce objectives and raise awareness.

53 <https://www.globalcovenantofmayors.org/our-cities/>

54 <https://climateaction.unfccc.int/views/total-actions.html>

55 <https://www.cdp.net/en/cities/cities-scores#cbb37401d648375c9a32619279b03418>

56 NDCP, 2020a

57 WRI, 2017

Myanmar's inclusion of 'sustainable urban development' in their INDC⁵⁸ was a progressive foresight for a country that in 2015 had a 70% rural population and contributed only 0.4%⁵⁹ to global GHG emissions. **This inclusion could be attributed to three main aspects.**

Firstly, there was incipient political awareness of the up and coming challenges of urbanisation (during 2012–2015, the vehicle fleet alone in the Yangon Region grew 37%⁶⁰).

Secondly, at the time of the INDC development, various policy processes were underway including the National Environmental Policy, the Roadmap for the National Urban Policy, as well as the National Climate Change Policy, Strategy, and 6 sectoral plans. One which focusing on Resilient, inclusive and sustainable cities and towns⁶¹.

Therefore, active drafting teams and consultations with, for example, township (district) representatives, were already underway, which the INDC could draw on. And thirdly, the Ministry of Natural Resources and Environmental Conservation developing the INDC had a resident Chief Technical Advisor on climate change, with background on urban development and planning, which ensured issues of urban climate change were also reflected. The on-going NDC revision process indicates that urban issues remain prominent, insofar that it builds on the existing Climate Change Policies and Strategies adopted in 2019, in which the urban pillar is very structured and detailed.

In the urban context, this is particularly pertinent in relation to national and local urbanisation policies, such as National Urban Policies (NUPs), Disaster Response or Disaster management

plans (as part of the Sendai Framework) and of course SDG 11 aiming to make cities and human settlements inclusive, safe, resilient and sustainable.

The Climate Emergency, Urban Opportunity report⁶² finds that only Colombia, Fiji, Indonesia, Mongolia, Rwanda, South Sudan and Tonga have both NUPs and NDCs that address this issue, although many more countries have NDCs and NUPs that speak to urban adaptation and resilience.

Chile's 2nd NDC⁶³: "By 2030, the National Policy for Disaster Risk Reduction 2019-2030 will be fully implemented, and its content will be harmonised with the Sendai Framework for Disaster Risk Reduction, the Paris Agreement and the 2030 Agenda for Sustainable Development. This policy instrument will also be reviewed by 2023".

58 INDC: Intended Nationally Determined Contribution. Government of Myanmar (2015)

59 CAIT WRI, including LULUCF

60 <https://www.adb.org/sites/default/files/publication/189083/mya-urban-transport.pdf>

61 http://myanmarcoalition.org/mcca/wp-content/uploads/2015/12/MCCMP_ENG_READY-TO-PRINT_27-May-2019.pdf

62 CUT, 2019

63 Government of Chile, 2020

B3. Prioritize key urban climate opportunities

For the purposes of this guide, the opportunities for urban climate action have been presented in terms of mitigation and adaptation, from a sectoral perspective.

However, **considering the inter-relationships between mitigation and adaptation benefits when prioritising urban climate actions can leverage even greater opportunity and long-term resilience.**

For example the reduction of food loss and waste represents a cross-cutting opportunity in the context of climate action, as it addresses both adaptation and mitigation objectives with its collective contributions towards enabling more productive, resilient and low-emission food systems⁶⁴. Or combining water efficiency measures and innovative urban water management systems will both decarbonise water consumption and maintain a healthier water supply.

Many nature based solutions (such as bio-retention, restoration of ecosystems) exist to address key hazards in urban areas, and urban forests act as both carbon sinks and as a means of responding to the urban heat island effect. Or conservation of urban watersheds and coastal mangroves. Just a few examples of interventions that enhance both mitigation and adaptation

Costa Rica's NDC⁶⁵: "commits to having in every city, by 2020, and every coastline county in the country, a land use plan which considers vulnerabilities to climate change and measures for increasing adaptation and mitigation".

Other cross-cutting issues for increasing urban climate action include focusing on developing policy, legal, and institutional frameworks that enable climate action by local governments; establishing climate funds that local governments can apply to as a way to provide them with access to international climate resources; developing guidance for local level climate action planning; or establishing an MRV mechanism that allows for consolidated national level reporting on progress that includes local actions and so on.

Such policy measures are completely appropriate to include in an NDC, and some countries have made the links between focusing on both mitigation and adaptation measures.

Opportunities have been presented sectorally across mitigation and adaptation as this is a natural entry point into the NDC process, and many cities are currently working in this manner. However, in the long-term looking more cross-sectorally at urban issues would be beneficial.

B3.1 Key urban mitigation opportunities

Whilst NDCs are often organised sectorally, applying an urban and human settlement lens can realise new opportunities to the selection of suitable sectoral options e.g. decarbonising of transport in cities (mass transit, cycling, walking all enabled by density) will differ to decarbonising transport in rural areas.

Urban areas present a unique opportunity to capitalise on intelligent spatial planning to reduce emissions. Thinking in mid-to long-term planning horizons for climate change at an urban level is important in the spatial planning process, as patterns of settlement can be "locked in" for foreseeable future

64 FAO, 2017

65 Government of Costa Rica, 2015

Half of the mitigation potential comes from decarbonising urban electricity⁶⁶. A sizable share of emissions could be further avoided through city-level mitigation options, such as spatial planning (to ensure connectivity, accessibility, mixed land-use, and an appropriate level of density), improving transit options, increasing and co-locating employment and residential densities, and increasing green spaces⁶⁷.

In cities, modern renewables can provide thermal energy buildings, water & process heating, and cooling^{68,69}. The greatest potential for mitigating greenhouse gas emissions may lie in measures taken in the rapidly developing cities in industrialising countries.

However, many rapidly developing cities lack the financial, technological, institutional and governance capacity required for effective mitigation⁷⁰. The appropriate options will need to be discussed as part of an inclusive stakeholder process and be based on best available technical evidence (e.g. city-wide marginal cost abatement, or city level analyses). Urban mitigation priorities may vary across developing, rapidly urbanising, and developed countries, and the profile of urban areas and human settlements in that country context also need to be considered. A variety of urban mitigation opportunities (including both policies and measures) that have been identified across literature/experts, include, for example:

Table 1 Urban climate mitigation opportunities presented sectorally (based on GIZ⁷¹, CUT⁷², REN21⁷³)

URBAN CLIMATE MITIGATION OPPORTUNITIES	
Energy	District heating & cooling; energy efficiency; clean energy procurement; decarbonisation of electricity supply (nationally and/or locally) through decentralised and renewable energy options; remove short lived climate pollutants (black carbon, HFCs); fuel switching, more efficient cooking and water heating in residential buildings; indoor plants can improve air quality;
Buildings	Green building codes; green roofs, facades and vertical gardens; retrofitting existing buildings; reduced use of materials in building construction; sustainable building materials procurement; more efficient space heating and cooling in all buildings; ...
Transport & Mobility	Mass transit; smart shared transport; a shift from using private cars to public transport, cycling and walking; more efficient and electric vehicles; electric charging points; Reduction of traffic by creation of walkable compact mixed-use neighbourhoods; provision of public transport system; safe bicycle network; and promotion of efficient and electric vehicles; remove short lived climate pollutants (black carbon); logistics improvement; using green infrastructure to protect transport lines while storing carbon;
Materials & Waste	Improved cement production processes; waste prevention; waste separation recycling, reuse; improving solid waste management; 3R (reduce, reuse, and recycle) and circular economy strategies; Reduce food waste and loss; waste-to-energy; methane capture and utilisation;
Urban Planning	Reduction of land consumption through compact urban design (e.g. establishing climate friendly building codes, densification where appropriate, designation of protected areas and restricted zones for settlements); NBS e.g. hybrid or green infrastructure, urban forests, parks, green corridors ; blue carbon ecosystems (mangrove forests, seagrass areas);
Water & Sewage	Energy efficiency of water and wastewater treatment plants and the use of renewable energies; waste reduction; water reuse; NBS e.g. hybrid to green infrastructure: sustainable urban drainage (SuDs), bioswales, ponds, urban wetlands;

66 CUT, 2019: Primarily by generating electricity from non-emitting technologies such as solar, wind, hydro, nuclear, biomass and geothermal power – as well as carbon capture and storage technologies.

67 UNEP, 2019

68 REN 21, 2019

69 UNEP, 2019

70 University of Cambridge and ICLEI (2014)

71 BMZ (forthcoming June 2020)

72 CUT, 2019

73 REN 21, 2019

Examples of NDCs where urban mitigation has been included

Transport

Suriname's 2nd NDC⁷⁴ has added Transport and Infrastructure (from its first NDC); "Transport is a large and growing source of emissions. With more than two thirds of the population living in and around the capital, Paramaribo, the combined challenge of increasing resilience of urban infrastructure and reducing transport emissions defines Suriname's approach to the sector. A combination of investment and regulation is included as a contribution."

China's NDC⁷⁵: "To develop a green and low-carbon transportation system, optimising means of transportation, properly allocating public transport resources in cities, giving priority to the development of public transportation and encouraging the development and use of low-carbon and environment-friendly means of transport".

Japan's 1st NDC⁷⁶: Urban related measures in transport sector include "promotion of public transport, modal shift to railway, energy consumption efficiency improvement of railways, promotion of car sharing"

Building Codes

Uganda's NDC⁷⁷: "Ensuring that land use plans and building codes reflect the need to make public and private buildings more climate resilient"

Malawi's NDC⁷⁸: "Increase use of soil-cement stabilised block and rice husk ash blended cement to around 10% of current cement production...develop and implement climate related building codes/standards. Revise existing building standards in line with climate change"

Energy

Cameroon's NDC⁷⁹: "Construction of a national 225 kv line to interconnect all cities, cross-country power grid (between adjacent cities)"

Japan's 1st NDC⁸⁰: "Promotion thermal insulation in renovation of existing houses; Promotion of nationwide campaigns (thorough promotion of Cool Biz/Warm Biz, repair of local government buildings). (Non-energy) reduction of municipal solid waste incineration"

74 Government of The Republic of Suriname, 2019

75 Government of China, 2016

76 Government of Japan 2016 & 2020

77 Government of Uganda, 2015

78 Government of Malawi, 2017

79 Government of Cameroon, 2016

80 Government of Japan 2016 & 2020

B3.2 Prioritize key urban adaptation and resilience opportunities

Urban climate adaptation and resilience measures are very context specific and vary depending on regional and local climate hazards, the geography (coastal, inland, mountains), the vulnerability of communities, and many more factors.

Therefore, where available, the results of national, regional and local climate data and risk assessments need to be reflected in an NDC, and several countries have done so through the inclusion of specific coastal resilience or urban adaptation content. Various NDC's have outlined urban adaptation and resilience measures:

Liberia's NDC⁸¹: "Building of coastal defence walls to reduce the vulnerability of urban coastal areas. Develop and implement Coastal Zone policy, strategy and management plan. As 70% of the population and thus the major human concentration are on the coast, this planning measure involves cities."

Fiji's NDC⁸²: "There is a need for strengthening the role of local governments in building resilience: Review the town plan regulations to facilitate the enforcement of zoning and buffer zones for coastal areas, river banks, high risk areas and mangrove areas"

Dominica's NDC⁸³: "Vulnerability of human settlements in Dominica to existing weather and climate change can be viewed in terms of risks from coastal processes, inland flooding, and landslides. A consistent feature of human settlements in Dominica is the vulnerability of roads and buildings to storm surge flooding and landslides".

Singapore's NDC⁸⁴: "Extensive roadside tree planting contributes to moderating temperatures in the heart of the city. Over 300 parks and a network of park connectors provide relief from the hot urban tropical climate. Large freshwater bodies surrounded by forested catchments help to ameliorate the urban island heat effect and conserve our rich natural heritage of flora and fauna. Singapore will continue efforts to safeguard its biodiversity despite an urban environment".

Japan's NDC⁸⁵: "considers the promotion of measures for energy efficiency and conservation/ renewable energy in [the] water business...low-carbonisation of cities by improving urban thermal environments through measures against the urban heat island effect"

81 Government of the Republic of Liberia, 2018

82 Government of Fiji, 2016

83 Government of Dominica, 2016

84 Government of Singapore, 2016

85 Government of Japan 2016 & 2020

If not done already, an in-country process including relevant urban stakeholders to analyse hazards and vulnerabilities, and subsequently identify and prioritize urban adaptation and resilience measures across key sectors will identify the most appropriate opportunities.

In order to be able to implement adaptation actions it is necessary be able to assess vulnerabilities (e.g. poverty, informality) and also to assess what is needed to create readiness/ capacity to address adaptation in terms of finance, governance, data/information, planning.

A potential approach could be to firstly to extract the most pressing regional climate impacts

(depending on hazards and vulnerabilities) and then identify actions for different urban-relevant sectors of the economy, and potential prioritisation of the most vulnerable communities in cities

Table 2 below, as an example, takes 5 sectors- urban infrastructure, water, land use planning, coastal & maritime sector, and energy- populated with indicative options outlined in literature.

Other sectors could include health, tourism, and more broadly considering how adaptive capacity relates to disaster risk management.

Table 2 INDICATIVE EXAMPLE: The key urban adaptation opportunities for selected sectors, that have been identified across literature⁸⁶:

Hazards	Rising temperatures exacerbate urban heat islands & amplify heat waves	Drought	Intense precipitation flooding, landslides, soil erosion	Coastal hazards Sea level rise, storm surge, coastal erosions
SECTOR	MEASURES	MEASURES	MEASURES	MEASURES
Urban Infrastructure Schools; hospitals; housing; transit; roads etc.	Optimisation of building orientation & building fabric; passive ventilation design; Mitigating radiant load; Reducing internal air temperature; manage working hours seasonally; NBS: urban forests; parks, trees, grey-to-green or hybrid infrastructure.	Optimise operational water consumption and reuse; Modify processing techniques; Set incremental water recycling targets; rainwater harvesting; watershed management; integrated water resource management	Optimise site selection; hazard proof housing and infrastructure; include green and brown drainage; upgrade informal settlements; NBS: permeable pavements; urban wetlands to gather excess rain.	Careful site selection of new developments; stringent building codes; NBS: coastal sand dunes and mangrove ecosystems as buffers.
Water Supply & Discharge	Water security and water management: NBS measures can address urban heat and water management such as urban green areas and wetlands, which improve water flow and cool down areas.	Set water consumption targets for industry; Identify alternatives for high water consuming industrial processes ; integrated water resource management of the area surrounding the urban area.	Flood barriers; Sustainable Urban Drainage Systems (SUDS) ; urban wetlands to gather excess rain; bioswales; green dykes;	Protection & restoration of mangroves or coastal marshland and/or mangroves; SUDS

⁸⁶ Such as: IAEA (2019), FAO (2017), Kapos et al (2019), Kennedy et al (2019), Davis et al (2015), Secretariat of the Convention on Biological Diversity (2019).

Land Use Planning	Provision of cool spaces during heat waves; introduce green canopies, green corridors for air flow across the city, green spaces and green roofs to reduce heat island effect.	Increased urban tree cover and green spaces; water protection activities in urban source watersheds; integrated water resource management of the area surrounding the urban area	Watershed management to reduce volume and flow of water; 'Bio-retention' (green space, green roofs, bio swales); urban wetlands to gather excess rain; bioswales; green dykes; renature rivers to regain natural and better managed river flow.	Protection & restoration of coastal marshland, mangroves and sand dunes; protection of coral reefs and sea grass areas. Zoning policies designating some areas as off-limits for construction.
Coastal & Maritime Ports, residential, transport, industry	NBS measures, such as urban green areas and wetlands, reduce heat island effect in urban coastal areas	Integrated water resource management and integrated coastal zone management.	Businesses and housing associations/ developers to consider historical & future flood maps; keep up to date atlas of flood-prone areas, Integrated water resource management and integrated coastal zone management, green dykes, coastal ecosystem restoration and management. Upland ecosystem management.	Construction of sea walls; monitoring of water levels; community based early warning systems; Protection & restoration of mangroves and sand dunes. Optimise site selection of production, transport and warehousing facilities. Integrated water resource management and integrated coastal zone management.
Energy	<p>Wind: consider extreme temperature ranges in turbine material and lubricant selection</p> <p>Solar PV: install cooling facilities to reduce efficiency losses: Install passive cooling (natural air flows) for photovoltaic panels or apply active cooling by forced air or liquid coolants</p> <p>Electricity grid: Consider higher temperatures in design; manage underneath vegetation to keep it at a distance from cables; consider placing cables underground</p>	<p>Wind: Modify turbine design and blade coatings; Increase the frequency of blade cleaning & maintenance</p> <p>Thermal power: Reuse wastewater, recover evaporated water in recirculating systems; Improve wet cooling; install dry cooling</p>	<p>Raise elevation of backup diesel generators</p> <p>Electricity grid: adjust wind loading standards to projected future conditions; re-route lines across open areas or along roads; cut back vegetation regularly to safe distance; Invest in better storm & hurricane forecasting tools; Consider placing cables underground</p>	<p>Site selection & location e.g: raise dykes and other protective embankments</p> <p>Wind: enhance resource assessment and site selection according to changing conditions</p>

Or alternatively consider taking any urban climate challenges listed in the NDC to identify potential response measures, and then allocate the action to the relevant sector it relates to.

Key hazards and measures will differ within sectors. Take the energy sector, where wind turbines are more vulnerable to storms

and ice, solar power to overheating or dust storms, where thermal & nuclear power are more vulnerable to sea level rise, or drought,. Therefore, it's essential to go through this 'hazards – impacts – measures' within each sector.

It is also important to consider the adaptive capacity and vulnerability of communities, particularly those more marginalised. The Spectrum of Urban Adaptive Capacity (from the IPCC 5th Assessment report) suggests that 1 billion urban dwellers live in urban areas with very little capacity to adapt to climate change and another 1.5 billion live in urban centres with only some capacity.

Few live in urban centres with climate resilience⁸⁷. Roughly one billion people live in slums or informal settlements, many of which are located in areas vulnerable to climate hazards – their vulnerability compounded by inter-linked socio-economic, ecological, and infrastructure conditions.

For these people, climate risks are intensified by lack of housing, services, and infrastructure; environmental degradation due to unsustainable urban development; and lack of integrated planning⁸⁸. Sex-disaggregated and gender sensitive data should also be considered to take into account gender differentiated conditions.

B4. Outline a clear finance strategy for each urban mitigation and adaptation opportunity

Finance is a key pillar of the Paris Agreement and NDCs⁸⁹, and identifying how actions will be financed is critical for reaching implementation. Mobilisation of innovative finance also underpins the efforts to enhance ambition. Financing requirements to increase urban mitigation and adaptation actions within NDCs will require a substantial shift in both long-term national budget expenditure as well as better collaboration between all public and private sector actors in order to mobilise finance that enables impacts at the local level. A city's ability to make climate-smart investments, particularly in emerging economies, often relies on the reallocation of existing budgets and the ability to raise revenue^{90, 91}.

Framing climate actions within the NDC in such a way that they have the greatest opportunities for attracting finance (e.g as bankable projects, or ambitious climate projects) depending on what kind of finance (public/international/private) or instrument (grant/loan/risk mitigation/equity), would be a strategic step towards increasing implementation.

Where NDCs are conditional on financial support, the financial strategy could encourage innovative local leaders to try to mobilise international resources. Sustainable urban climate actions articulated in NDCs offer opportunities to attract finance across public and private finance institutions, and through international climate finance⁹².

87 Satterthwaite et al., 2020

88 Kapos, 2019

89 In particular 2.1 (c) of the Paris Agreement Making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development.

90 IFC, 2018

91 See C40s City Finance Facility report on investment and revenue opportunities for municipalities

92 The NDC Partnership has developed the Climate Finance Explorer which filters out climate funds and those that sub-nationals are able to apply for: <http://ndcpartnership.org/toolbox/climate-finance-explorer>. Many of the multilateral banks have also set up specific NDC related support facilities.

Finance mechanisms supporting sub-national climate action aligned with NDCs

Many International Climate Finance mechanisms are supporting activities by national and sub-national government that are aligned with NDCs, therefore articulating urban climate action within the NDC is a means of attracting finance.

Examples of explicit reference of international climate finance alignment with NDC:

In the Green Climate Fund (GCF) Investment Criteria Indicators Policy Document (Section 2.5, Point 10). *'Project proposals should clearly describe how the proposed activities align with the country's NDC and other relevant national plans, and how the funding proposal will help to achieve the NDC or these plans by making progress against specific targets defined in national climate policies and strategies, such as nationally appropriate mitigation actions and national adaptation plans'*⁹³. More specifically relating to urban projects, technical GCF guidelines state *'projects dealing with cities and climate change will be considered under the following sectors listed: Decarbonisation of the energy sector; Improving energy efficiency in building stocks; mobility and transport; urban form; adaptation to climate change, materials and material flow, improving waste management, urban water and sanitation'*⁹⁴.

The Clean Technology Centres & Networks (CTCN) Theory of Change framework requires projects to demonstrate that: *"Environmentally sound technologies are developed, transferred and deployed for low-carbon and resilient development in developing countries in response to National Determined Contributions, National Adaptation Plans and national plans"*⁹⁵

The Adaptation Fund also requires consistency with national sustainable development strategies, such as national communications and national adaptation programmes of action and other relevant instruments⁹⁶.

Some of the major climate funds are recognising that gender equality is important for the increased impact of funding and the achievement of adaptation and mitigation objectives. The GCF and the Global Environment Facility (GEF) have established gender policies recognising the importance of gender in the impact of and access to funding⁹⁷.

An example of gender mainstreaming for an urban climate action comes from a Sustainable Urban Transport project in Vietnam where Sustainable Urban Transport where targets were set for women to make up 20 percent of the construction workforce and 30 percent of station employees. The transit system establishment dedicated waiting areas for women on platforms, shop space for women-owned businesses, and women-only carriages with additional seating for children and storage space for prams/shopping. Efforts to target women metro users included the installation of secure street lighting and security cameras⁹⁸.

93 GCF, 2019a

94 GCF, 2019b

95 CTCN, 2020

96 Adaptation Fund, 2009

97 UNDP, 2016

98 UNDP, 2016

The scale of investment for the urban climate intervention will affect which financial instruments are appropriate – large urban infrastructure investments such as metro systems will require support from national level ministries, whereas smaller localised energy efficiency retrofits can be managed by local government. Infrastructure (for example) can be financed by government revenues directly, through debt, or through leveraging private sector resources through privatisation of service delivery or through various forms of Public Private Partnerships (PPPs).

Various opportunities for mobilising finance for urban climate action exist. Firstly, to collate – where available - a pipeline of climate compatible urban infrastructure projects e.g. mass transit, charging stations, wind farms etc., in the NDC and articulate the financing needs. In fact, 66% of country support requests for financial support through the NDCP relate to developing bankable projects and pipelines primarily in energy, infrastructure, disaster risk management and resilience interventions, and water and sanitation⁹⁹.

The Republic of the Marshall Islands has indicated financing needs through the NDC Partnership to construct seawalls in vulnerable residential areas, and Ethiopia has requested technical assistance for proposal development of fundable projects on land rehabilitation projects¹⁰⁰.

Secondly is for the NDC process to facilitate a discussion across all key ministries (e.g. housing, transport, finance, etc.) to allocate financial resources in a systematic manner that can leverage urban climate action in the long-term.

It is necessary to ensure that these subnational responsibilities are matched with commensurate authorities and resources, thereby creating enabling environment at the local level for local and regional governments to deliver on shared national climate commitments.

Thirdly, national policy direction influences investment decisions. Consider the nature and format of the NDC as a means of potentially guiding private sector investments, and if possible, to involve important national, regional and local industry in the process.

Ambitious targets on mitigation can be achieved with the help of investments in e.g. green buildings and retrofitting or investing in low carbon mobility options. There is also the potential to establish a national climate fund using international and national climate resources, to which a local government can apply.

99 NDCP, 2020b

100 NDCP, 2020a

Case Study Box 6:**Support for sub-national finance related issues within NDC:**

Through the Climate Action Enhancement Package (CAEP) Mexico is planning to develop an investment package of strategic measures for its NDC, including some (federal) state-level projects. These will result in a pipeline of bankable projects that could be submitted to the Green Climate Fund or other financiers.¹⁰¹

A combination of systematically incentivising lower carbon options, increasing public investments on adaptation and ensuring impacts reach the local level can act as an enabler for enhanced climate action.

One of the research outcomes of the 2018 IPCC Cities conference was to develop frameworks and tools to integrate climate considerations into fiscal and financial decision-making at the city scale. Whilst NDCs can help with leveraging financing (in terms of obtaining and structuring the money needed) for urban climate action, it will be the responsibility of local government to consider the best funding options (how you pay back the financing and the money needed for operation and maintenance)^{102,103}.

B5. Allocate responsibility, time frames, budgets, and monitoring

Include a set of concrete actions, along with their respective financing needs and sources, in the NDC is a necessary starting point. To move towards implementation of these actions also requires allocation of responsibility

and timeframes and monitoring plan. It is important to clearly allocate responsibilities for government, public and other stakeholders to be able to monitor progress from the various institutions.

This allocation and responsibility applies at each level of government – from national ministries to local governments. It is essential to spell out that any sub-national responsibility must be matched with commensurate authorities and resources, to avoid devolution of responsibility without devolution of capacity.

Such involvement at the same time requires local level alignment of plans and actions towards shared national goals, the active participation in such a process through preparation of quality inputs and the target and indicators setting for monitoring local action is essential for collaborative climate action.

Take the case of the second NDC submitted by Suriname in 2019 (Case Study Box 7) where an NDC Project Pipeline including budget, type of finance, timeline and responsibility, has been included in the annex of their revised NDC:

101 NDCP, 2020a

102 See C40 Finance Facility Report Explainer: How to finance urban infrastructure, 2019 for more details

103 Further resources: Cities Climate Finance Leadership Alliance : and Climate Investment Opportunities in Cities report by the International Finance Corporation and the MDB Joint report on multilateral development banks climate finance.

Case Study Box 7¹⁰⁴

Suriname, Second NDC, NDC Project Pipeline

Sector	Name	Lead MDA	Duration	Start/End	Location	Objective	Finance (million USD)	Revenue generation/ Non-Revenue generation	Types of Finance
Energy	Demonstrate sustainable business models	Ministry of Natural Resources (MNR) and Dept. for Rural Energy Supply (DEV)	5 years	2020 - 2025	>200 villages situated in the hinter land (exact location (TBD))	Promote renewable energy (RE) by more to the suitable electrification of >200 villages in the interior by the replacement of existing use of diesel by solar supply and solar/hybrid systems	80	Revenue generating	Capital (Funds or physical assets) Grants and subsidies, equity and concessional loans

Norway's 2nd NDC (not in 1st): The Ministry of Climate and Environment has the overarching cross-sectoral responsibility for coordination and implementation. The Ministry of Finance is responsible for the tax schemes and the other ministries are responsible for policies in their respective sectors. Further details on institutional arrangements are found in Norway's 7th National Communication, Chapter 4.1.3. "Local governments are responsible for implementing policies and measures at the local level, for example through waste management, local planning and some transport measures. In 2009, guidelines were introduced for climate and energy planning in the municipalities. New guidelines describing how the municipalities and counties can incorporate climate change adaptation work into their planning activities are currently being developed."

B6. Evaluate technology options that may enhance decarbonisation and resilience of the urban environment

Technology features in NDC development both in terms of identifying technological gaps (including capacity) as well as considering technological breakthroughs. It is essential to consider the role of technology to implement urban climate actions as both an enabler (gathering observation, data, modelling, and scenarios at the city level¹⁰⁵), and to create new disruptive opportunities to respond to climate change.

And identify any opportunities for technological leapfrogging – e.g. transitioning directly to decentralised energy systems – and the enablers required to implement these. Understanding technology end users, and technology access and cultural norms across male and female citizens is important in terms of e.g. public transport or energy.

The NDE Report¹⁰⁶, which assesses the key technology support requests across Technology Needs Assessments and NDCs, reveals that technology needs are most frequently identified in the areas of low emission energy supply, energy efficient cities and infrastructure and

104 Government of The Republic of Suriname, 2019

105 World Climate Research Programme (2019)

106 NDE Germany (2017)

low emission mobility and transportation. In the field of adaptation, most technology needs are identified in the areas of climate compatible agriculture and forestry, water management, disaster prevention and meteorological measurement technology and climate simulation.

The Clean Technology Centres & Networks (CTCN) offers technical assistance to national and sub-national governments for climate activities articulated in their NDC.

CTCN Jakarta example of sub-national support for urban climate action: The Jakarta Research Council, on behalf of the Provincial Government of Jakarta, requested support from the CTCN in building the capacity of stakeholders and decision makers with **regard to flood management, as well as to evaluate the best technologies and methods for flood reduction and climate resilient infrastructure in Jakarta.**

In line with their NDC, which states *an aim to reduce risks on all development sectors by 2030 through local capacity strengthening, improved knowledge management, convergent policy on climate change adaptation, and disaster risks reduction, and application of adaptive technologies*¹⁰⁷. A hydrodynamic flood model was developed and tailored for Jakarta in the context of climate change, local capacity was built in using the model, along with policy recommendations¹⁰⁸.

The revision of NDCs provides an opportunity to consider how new disruptive, or existing technologies might enhance the decarbonisation of urban environment. Innovations are growing around online shared mobility platforms, smart cities and digitisation, and building technologies. Evaluating technology options as well as the required needs and capabilities (potentially with assistance from CTCN) that may enhance decarbonisation and resilience of urban environments, can be done at a sub-national level.

Moldova's Updated NDC¹⁰⁹: Promote climate-friendly solutions at municipality level and infrastructure resilience projects through innovative technologies that will contribute to reducing vulnerability to climate change and improving the quality of life.

107 First Nationally Determined Contribution of the Republic of Indonesia, November 2016

108 <https://www.ctc-n.org/technical-assistance/projects/hydrodynamic-modelling-flood-reduction-and-climate-resilient>

109 Government of the Republic of Moldova, 2020

Next Steps

This guide makes the case for 'why' it is important, and 'how' it is possible, to increase the urban content and human settlements in NDCs. It highlights the opportunities from urban climate action through engaging inclusively across a broad spectrum of urban-relevant ministries and organisations.

Critical is that these guiding words are translated into action, therefore we at UN-Habitat will be working actively with Member States to support the application of the opportunities and recommendations outlined within this guide.

We endeavour to use all available networks to ensure this support is available to the broadest possible number of Member States through partners and the UNFCCC.

In parallel we will continue to collect more evidence and experience on how to strengthen urban issues in NDCs and improve guidance continuously by building a community of practice to support the NDCP partnership and others to strengthen technical assistance in this area.



The landscape of mangrove forest, city in Teluk Bintuni Regency, West Papua Province, Indonesia ©Shutterstock

Reference Material & Resource Guide

Adaptation Fund (2009), Operational Policies and Guidelines, Annex 1. Available at: <http://www.adaptation-fund.org/wp-content/uploads/2015/01/OPG%20ANNEX%201.pdf>

African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, European Investment Bank, Inter-American Development Bank Group, Islamic Development Bank, World Bank Group (2019), 2018 Joint Report on Multilateral Development Banks Climate Finance. Available at: <https://publications.iadb.org/en/2018-joint-report-multilateral-development-banks-climate-finance>

Ballard, S., Porro, J., Trommsdorff, C. (2018), Water and Wastewater Companies for Climate Mitigation (WaCCLiM). A Roadmap to a Low-Carbon Urban Water Utility: An international guide to the WaCCLiM approach. Available at: https://wacclim.org/wp-content/uploads/2018/12/2018_WaCCLiM_Roadmap_EN_SCREEN.pdf

Bongardt, D. et al., Transformative Urban Mobility Initiative (2019), Sustainable Urban Transport: Avoid – Shift – Improve (A-S-I) (Bonn and Eshborn, Germany: GIZ, 2019). Available at: https://sutp.org/files/contents/documents/resources/L_iNUA/ASI_TUMI_SUTP_iNUA_April%202019.pdf

BMZ (forthcoming June-July 2020): Climate Change Mitigation in Cities

Clean Technology Centres and Networks (CTCN) (2020), CTCN Monitoring & Evaluation System, Monday, March 30, 2020. Available at: <https://www.ctc-n.org/resources/ctcn-monitoring-evaluation-system>

Coalition for Urban Transitions (CUT) (2019), Climate Emergency, Urban Opportunity. World Resources Institute (WRI) Ross Center for Sustainable Cities and C40 Cities Climate Leadership Group. London and Washington, DC. Available from: <https://urbantransitions.global/urban-opportunity/>

C40 (2019), The future of urban consumption in a 1.5°C World, Headline Report. Available at: <https://www.arup.com/perspectives/publications/research/section/the-future-of-urban-consumption-in-a-1-5c-world>

C40 and Arup (2016), Deadline 2020: How Cities will get the job done. Available at: <https://www.c40.org/researches/deadline-2020>

C40 and McKinsey Centre for Business and Environment (2017), Focused Acceleration A strategic approach to Climate Action in cities to 2030. Available at: <https://www.c40.org/researches/mckinsey-center-for-business-and-environment>

C40 Cities Finance Facility (2019), Explainer: How to finance urban infrastructure. Available at: https://www.c40knowledgehub.org/s/article/Explainer-How-to-finance-urban-infrastructure?language=en_US

Davis, M., Krüger, I. Hinzmann, M. (2015). Coastal Protection and SUTS-Nature Based Solutions, Policy Brief No. 4, November 2015. Ecologic Institute. Available at: <https://www.ecologic.eu/sites/files/publication/2017/2723-recreate-pb-nature-based-solutions.pdf>

Food and Agriculture Organisation of the United Nations (FAO) (2017), Save Food for a better Climate: Converting the food loss and waste challenge into climate action, Rome 2017. Available at: <http://www.fao.org/3/a-i8000e.pdf>

GIZ (2018a), (in cooperation with UNDP) Implementing National Climate Policies through Subnational Climate Action in Chile. Available at: https://www.ndc-cluster.net/system/files?file=migrated_document_files/190318_gpd_parisabkommen_chile_rz.pdf

GIZ (2018b), (in cooperation with UNDP) Paving the way for success: A comprehensive Participatory Process for NDC Implementation in Peru. Available at: https://www.transparency-partnership.net/system/files/migrated_document_files/190318_gpd_parisabkommen_peru_rz.pdf

GIZ (forthcoming June 2020), Recover green: Higher NDC-Ambition through Collaborative Climate Action

GIZ (2017), Sectoral implementation of nationally determined contributions (NDCs), Briefing Series: Finance, Transport, Transparency, Energy Efficiency with a focus on buildings, Forestry and Land Use Change, Energy Supply, Agriculture. Available at: <https://www.transparency-partnership.net/documents-tools/briefing-series-sectoral-implementation-nationally-determined-contributions-ndcs>

GIZ (2018), Multi-Level Climate Governance – Supporting Local Action. Available at: <https://collaborative-climate-action.org/multi-level-climate-governance-supporting-local-action/>

GIZ, ICLEI and UN-Habitat (2018), Talanoa and Beyond: Raising Ambition with Cities and Regions, Joint Policy Briefing Note, UN-Habitat submission to the UNFCCC Talanoa Dialogue, April 2018. Available at: <https://ndcpartnership.org/news/talanoa-and-beyond-raising-ambition-cities-and-regions>

Global Covenant of Mayors, (2019) Climate Emergency, Unlocking the Urban Opportunity Together. Available at: <https://www.globalcovenantofmayors.org/wp-content/uploads/2019/12/2019-GCoM-Aggregation-Report.pdf>

Government of Chile (2020), Chile's Nationally Determined Contribution. Update 2020. Available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Chile%20First/Chile's_NDC_2020_english.pdf

Government of China (2016), Enhanced Actions on Climate Change: China's Intended Nationally Determined Contributions. Available at: <https://www4.unfccc.int/sites/ndcstaging/pages/Party.aspx?party=CHN>

Government of Costa Rica (2015), Costa Rica's Intended Nationally Determined Contribution. Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Costa%20Rica%20First/INDC%20Costa%20Rica%20Version%202%200%20final%20ENG.pdf>

Government of Dominica (2016), Intended Nationally Determined Contribution (INDC) of the commonwealth of Dominica. Available at: [https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Dominica%20First/Commonwealth%20of%20Dominica-%20Intended%20Nationally%20Determined%20Contributions%20\(INDC\).pdf](https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Dominica%20First/Commonwealth%20of%20Dominica-%20Intended%20Nationally%20Determined%20Contributions%20(INDC).pdf)

Government of Fiji (2016), Fiji's Intended Nationally Determined Contribution. Available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Fiji%20First/FIJL_iNDC_Final_051115.pdf

Government of Japan (2016 and 2020), Submission of Japan's Nationally Determined Contribution. Available at: <https://www4.unfccc.int/sites/NDCStaging/Pages/All.aspx>

Government of Norway (2020), Update of Norway's nationally determined contribution. Available at: [https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Norway%20First/Norway_updatedNDC_2020%20\(Updated%20submission\).pdf](https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Norway%20First/Norway_updatedNDC_2020%20(Updated%20submission).pdf)

Government of the Republic of Cameroon (2016), Intended Nationally Determined Contribution. Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Cameroon%20First/CPDN%20CMR%20Final.pdf>

Government of the Lao People's Democratic Republic (2015), Intended Nationally Determined Contribution. Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Lao%20People%27s%20Democratic%20Republic%20First/Lao%20PDR%20First%20NDC.pdf>

Government of the Republic of Liberia (2018), Intended Nationally Determined Contribution. Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Liberia%20First/INDC%20Final%20Submission%20Sept%2030%202015%20Liberia.pdf>

Government of the Republic of Malawi (2017), Intended Nationally Determined Contribution. Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Malawi%20First/MALAWI%20INDC%20SUBMITTED%20TO%20UNFCCC%20REV.pdf>

Government of the Republic of Moldova (2020), Updated Nationally Determined Contribution of the Republic of Moldova. Available at: https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Republic%20of%20Moldova%20Second/MD_Updated_NDC_final_version_EN.pdf

Government of the Republic of the Union of Myanmar, (2015), Myanmar's Intended Nationally Determined Contribution. Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Myanmar%20First/Myanmar%27s%20INDC.pdf>

Government of Singapore, (2016), Singapore's Intended Nationally Determined Contribution (NDC) and accompanying information. Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Singapore%20First/Singapore%20INDC.pdf>

Government of The Republic of Suriname (2019), (Second) Nationally Determined Contribution 2020. Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Suriname%20Second/Suriname%20Second%20NDC.pdf>

Government of Uganda, Ministry of Water and Environment (2015), Uganda's Intended Nationally Determined Contribution. Available at: <https://www4.unfccc.int/sites/ndcstaging/PublishedDocuments/Uganda%20First/INDC%20Uganda%20final%20%2014%20October%20202015.pdf>

Green Climate Fund (2019a), Investment Criteria Indicators, 28 February 2019. Available at: <https://www.greenclimate.fund/sites/default/files/document/investment-criteria-indicators.pdf>

Green Climate Fund, (2019b), Simplified Approval Process (SAP) Technical Guidelines, Cities and Climate Change, 06 June 2019. Available at: <https://www.greenclimate.fund/sites/default/files/document/sap-technical-guidelines-cities-and-climate-change.pdf>

ICLEI (2017), Boosting subnational climate action through new climate governance. Available at: http://e-lib.iclei.org/wp-content/uploads/2017/11/20171101_cCR-report_final-web.pdf

ICLEI (2019), Resilient Cities, Thriving Cities: The evolution of urban resilience. Available at: http://e-lib.iclei.org/publications/Resilient-Cities-Thriving-Cities_The-Evolution-of-Urban-Resilience.pdf

IPCC (2018), Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. In Press.

International Atomic Energy Agency (IAEA), (2019), Adapting the Energy Sector to Climate Change. Available at: <https://www.iaea.org/publications/12338/adapting-the-energy-sector-to-climate-change>

International Finance Corporation (2018), Climate Investment Opportunities in Cities: An IFC Analysis. Available at: https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/climate+business/resources/cioc-ifc-analysis

Kapos, V., Wicander, S., Salvaterra, T., Dawkins, K., Hicks, C. (2019), The Role of the Natural Environment in Adaptation, Background Paper for the Global Commission on Adaptation. Rotterdam and Washington, D.C.: Global Commission on Adaptation. Available at: https://cdn.gca.org/assets/2019-12/RoleofNaturalEnvironmentinAdaptation_V2.pdf

Kennedy, M.; Fox-James, L.; Capizzi, P.; Brown, A.; Dethier, S., (2019), 'Case Studies on Integrating Ecosystem Services and Climate Resilience in Infrastructure Development: Lessons for Advocacy', WWF and Arup, Washington DC, 2019. Available at: https://c402277.ssl.cf1.rackcdn.com/publications/1263/files/original/Case_Studies_on_Integrating_Ecosystem_Services_and_Climate_Resilience_in_Infrastructure_Development_Lessons_for_Advocacy.PDF?1587564144

New Climate Institute (2018), Climate Opportunity: More Jobs, Better Health, Liveable Cities. Available at: <https://www.c40.org/researches/climate-opportunity-more-jobs-better-health>

NDC Partnership (NDCP) (2019), Dialoguemos NDC: A Participatory Process for NDC Implementation in Peru, Case Study. April 2019. Available at: <http://ndcpartnership.org/case-study/dialoguemos-ndc-participatory-process-ndc-implementation-peru>

NDC Partnership (NDCP) (2020a), Insight Brief: Engaging subnational governments in climate action Lessons learned from the NDC Partnership, Voita, T., March 2020. Available at: <http://ndcpartnership.org/sites/default/files/Local%20Mainstreaming%20Final%20March%202020.pdf>

NDC Partnership (NDCP), (2020b), Understanding NDC Financing Needs, April 2020. Available at: <https://ndcpartnership.org/sites/default/files/Understanding%20NDC%20Financing%20Needs%20Insight%20Brief.pdf>

New Climate Institute (2018), Non-State and Subnational Action Guidance, Guidance for integrating the impact of non-state and subnational mitigation actions into national greenhouse gas projections, targets and planning. Available at: <https://climateactiontransparency.org/wp-content/uploads/2018/08/ICAT-Non-State-and-Subnational-Action-Guidance-July-2018.pdf>

National Designated Entity (NDE) Germany (2017), The National Designated Entity (NDE) Germany Report: Identified technology needs in TNAs and (i)NDCs An introduction to the Technology Needs Database (TND) and analysis of technology needs identified by developing countries. Hans, F., Röser, F., Anica, A., Hagemann, M., Becker, C., Oppelt, D. Available at: https://newclimateinstitute.files.wordpress.com/2017/10/nde-germany_tnd-briefing-paper_final.pdf

REN, (2019), Renewables in Cities 2019 Global Status Report. Available at: <https://www.ren21.net/reports/cities-global-status-report/>

Rockstrom, J., Gaffney, O., Rogelj, J., Meinshausen, M., Nakicenovic, N., and Schellnhuber, H. J. (2017), A Roadmap for Rapid Decarbonization. *Science*, 355 (6331): 1269–1271. Available at: <http://pure.iiasa.ac.at/id/eprint/14498/>

Rogelj, J., den Elzen, M., Höhne, N., Fransen, T., Fekete, H., Winkler, H., Schaeffer, R., Sha, F., Riahi, K., and Meinshausen, M. (2016), Paris Agreement Climate Proposals Need a Boost to Keep Warming Well Below 2°C. *Nature*, 534 (7609): 631–639. Available at: <https://www.nature.com/articles/nature18307>

Satterthwaite et. al (2020), Building Resilience to Climate Change in informal settlements, 21st February 2020 One Earth Review. Available at: <https://www.cell.com/action/showPdf?pii=S2590-3322%2820%2930050-6>

Secretariat of the Convention on Biological Diversity (2019). Voluntary guidelines for the design and effective implementation of ecosystem-based approaches to climate change adaptation and disaster risk reduction and supplementary information. Technical Series No. 93. Montreal, 156 pages. Available at: <https://www.cbd.int/doc/publications/cbd-ts-93-en.pdf>

The Urban Land Trust (2016), The benefits of green infrastructure for heat mitigation and emissions reductions in cities. Available at: <https://www.tpl.org/sites/default/files/Benefits%20of%20GI%20for%20heat%20mitigation%20and%20emissions%20reductions%20in%20cities.pdf>

UNDESA (2019), World Urbanization Prospects: The 2018 Revision (ST/ESA/SER.A/420). United Nations, Department of Economic and Social Affairs, Population Division. New York: United Nations. Available at: <https://population.un.org/wup/Publications/>

UNEP (2019), Emissions Gap Report 2019, United Nations Environment Programme, Nairobi. Available at: <http://www.unenvironment.org/emissionsgap>

UNFCCC, 2018a (FCCC/PA/CMA/2018/3/Add.2). Decision 17/CMA.1 Ways of enhancing the implementation of education, training, public awareness, public participation and public access to information so as to enhance actions under the Paris Agreement. Available at: https://unfccc.int/sites/default/files/resource/CMA2018_03a02E.pdf

UNFCCC, 2018b, (FCCC/PA/CMA/2018/3/Add.1) Decision 4/CMA.1 Further guidance in relation to the mitigation section of decision 1/CP.21 Available at: https://unfccc.int/sites/default/files/resource/cma2018_03a01E.pdf

UN-Habitat (2015), Guiding Principles for City Climate Action Planning. Available at: <https://unhabitat.org/guiding-principles-for-climate-city-planning-action>

UN-Habitat (2017), Sustainable Urbanisation in the Paris Agreement, Comparative Review of Nationally Determined Contributions for Urban Content. Available at: <https://unhabitat.org/sustainable-urbanization-in-the-paris-agreement>

UN-Habitat (2016), Addressing Climate Change in National Urban Policy, A policy guide for Low-Carbon and Climate Resilient Development. Available at: https://www.uncclearn.org/sites/default/files/inventory/addressing_climate_change_in_national_urban_policy.pdf

UNDP (2019a), Pathway for Increasing Nature-based solutions in NDCs, A Seven-Step Approach for Enhancing Nationally Determined Contributions through Nature-based Solutions. Available at: <https://www.undp.org/content/undp/en/home/librarypage/climate-and-disaster-resilience/pathway-for-increasing-nature-based-solutions-in-ndcs.html>

UNDP (2016), Gender Equality in National Climate Action: Planning for Gender-responsive Nationally Determined Contributions. Available at: <https://www.undp.org/content/undp/en/home/librarypage/womens-empowerment/gender-equality-in-national-climate-action--planning-for-gender-.html>

UNDP (2019b), Gender Analysis and Nationally Determined Contributions (NDCs), Short Guidance for Government Stakeholders. Available at: <https://www.ndcs.undp.org/content/ndc-support-programme/en/home/impact-and-learning/library/gender-analysis-and-ndcs--short-guidance-for-government-stakehol.html>

UNDP (2019c), The Heat is On Taking Stock of Global Climate Ambition, NDC Global Outlook Report. Available at: <https://reliefweb.int/report/world/ndc-global-outlook-report-2019-heat-taking-stock-global-climate-ambition>

UNFCCC (2019), Cities Are Where the Climate Battle Will Largely Be Won or Lost. Article 11th October 2019. Guterres speech at C40 Summit. Available: <https://unfccc.int/news/guterres-cities-are-where-the-climate-battle-will-largely-be-won-or-lost>

University of Cambridge and ICLEI (2014), Climate Change: Implications for Cities: Key Findings from the Intergovernmental Panel on Climate Change Fifth Assessment Report. Available at: https://www.cisl.cam.ac.uk/business-action/low-carbon-transformation/ipcc-climate-science-business-briefings/pdfs/briefings/IPCC_AR5_Implications_for_Cities_Briefing_WEB_EN.pdf

World Bank Group (2011), Guide to Climate Change Adaptation in Cities. World Bank, Washington, DC. Available at: <https://openknowledge.worldbank.org/handle/10986/27396>

World Climate Research Programme (2019), Global Research and Action Agenda on Cities and Climate Change Science - Abridged Version. Prieur-Richard, A.H., B. Walsh, M. Craig, M.L. Melamed, M. Colbert, M. Pathak, S. Connors, X. Bai, A. Barau, H. Bulkeley, H.

Cleugh, M. Cohen, S. Colenbrander, D. Dodman, S. Dhakal, R. Dawson, J. Espey, J. Greenwalt, P. Kurian, B. Lee, L. Leonardsen, V. Masson-Delmotte, D. Munshi, A. Okem, G.C. Delgado Ramos, R. Sanchez Rodriguez, D. Roberts, C. Rosenzweig, S. Schultz, K. Seto, W. Solecki, M. van Staden, and D. Ürge-Vorsatz (Eds.). 11 pp. WCRP Report No. 3/2019. Available at: <https://futureearth.org/2019/09/20/global-research-and-action-agenda-on-cities-and-climate-change-science-published/>

World Resources Institute (2017), Enhancing NDCs by 2020: Achieving the goals of the Paris Agreement. Available at: <https://www.wri.org/publication/ndc-enhancement-by-2020>

World Resources Institute and UNDP (2019a), Enhancing NDCs: A guide to strengthening national climate plans by 2020. Available at: www.ndcs.undp.org/content/dam/LECB/docs/pubs-reports/undp-wri-ndcsp-ndc-enhancement-report-2019.pdf

World Resources Institute and UNDP (2019b), Scaling Up Ambition: Leveraging Nationally Determined Contributions and Long-Term Strategies to Achieve the Paris Agreement goals. Input Document for the G20 Climate and Sustainability Working Group. Available at: <https://www.ndcs.undp.org/content/dam/LECB/docs/pubs-reports/undp-ndcsp-wri-g20-lts-report-2019.pdf>



Solar water heaters save electricity and money – here installed on Groutville Care Homes in KwaDukuza, South Africa, as a pilot project implemented by Urban-LEDS

A better quality of life for
all in an urbanizing world

UN HABITAT
FOR A BETTER URBAN FUTURE

UNITED NATIONS HUMAN SETTLEMENTS PROGRAMME
P.O. Box 30030, Nairobi 00100, Kenya
T: +254-20-76263120
E: unhabitat-climate@un.org



www.unhabitat.org



The Urban-LEDS project
is funded by the
European Union.

Disclaimer: The sole responsibility for the content of this publication lies with the authors. It does not necessarily reflect the opinion of the European Union. The European Commission is not responsible for any use that may be made of the information contained therein.