CLIMATE ACTION PATHWAY

HUMAN SETTLEMENTS

Action Table

2020

Global Climate Action
United Nations Climate Change

Marrakech Partnership
Global Climate Action

ACTION TABLE STRUCTURE AND APPROACH

The Human Settlements Action Table outlines a set of necessary stakeholder actions to be taken in 2021, 2025, 2030 and 2040 to accelerate the transition to net-zero carbon, healthy and resilient human settlements. It focuses on two key aspects of human settlements: the built environment and waste and consumption within human settlements. It addresses actions for all stakeholders to take, since everyone must play their part, if we are to keep global warming to within 1.5^{0}C.

See the Marrakech Partnership Climate Action Pathway Human Settlements Executive Summary for an overview of these two aspects of human settlements, including a 2050 vision statement, system transformation summaries, key milestones for the built environment, and built environment progress and facts and figures.

For the built environment, the stakeholder actions are categorized into two impact areas: "Whole-life carbon mitigation" and "Adaptation and resilience". The "Whole-life carbon mitigation" impact area (impact area 1) addresses the emissions released at all life cycle stages (from product manufacturing, construction and use, to end of life) of buildings and infrastructure projects, new and existing. Taking a whole-life decarbonization approach, rather than focusing on operational and embodied emissions in silos, is important to ensure that total project carbon emissions are minimized, now and in the future. The "Adaptation and resilience" impact area (impact area 2) includes actions that stakeholders can take to make the communities and buildings we live in, and the infrastructure we use, whether new or existing, resilient to future climate shocks. Identifying vulnerability, adapting to changes in climate and future proofing of buildings and infrastructure are themes that are explored in this impact area. The proposed built environment actions link to the Energy, Industry, Transport, Land Use, Water and Resilience Marrakech Partnership pathways, as built environment decarbonization and resilience are intrinsically connected to and reliant upon parallel transformation in these other sectors.

For waste and consumption in human settlements, the stakeholder actions are categorized into three impact areas: "Zero-waste cities", "1.5ºC living" and "Social equity". The "Zero-waste cities" impact area (impact area 3) actions set out steps needed to achieve zero discharges to land, water or air across all activities in human settlements through implementation of five circular economy strategies: recover, reduce, reuse, rethink and regenerate. "1.5ºC living" (impact area 4) addresses actions required to reduce the greenhouse gas (GHG) emissions intensity of citizens'

lifestyles to achieve a net-zero world and limit global warming to 1.5ºC through changes to everyday practices. "Social equity" (impact area 5) includes actions that tackle access to low-carbon services and infrastructure, increase participation in developing and owning decarbonization and resilience solutions, and provide opportunity in the form of education and employment. The waste and consumption actions have strong links with all other Marrakech Partnership pathways, as they cover themes that cuts across sectors within human settlements.

This Action Table document is designed to have global applicability, but as the relevance and urgency of some actions may vary by geography and organization type, it should also be used as a framework for the development of tailored regional, national, city, district and organization pathways[1].

Cross-cutting lever: localizing climate financing

Local climate action is a theme that cuts across all Marrakech Partnership pathways, as changing local patterns of production and consumption is essential in accelerating towards net zero emissions and resilience in all sectors and in all parts of the world. Although the inception, planning and delivery of local climate action is led by local and regional governments (LRGs) in collaboration with local stakeholders, national governments and financial institutions must support this by localising climate financing. Actions national governments and financial institutions must take to do this, as prerequisites for local climate action, are:

1. Promote vertical integration of climate policies based on dialogues with LRGs. For example, integrate LRG actions in nationally determined contributions (NDCs) and national action plans.
2. Foster institutional frameworks and financial and fiscal incentives. For example, create an enabling environment for low-carbon procurement processes, implement fiscal decentralization and encourage local innovation of new financial models and instruments.

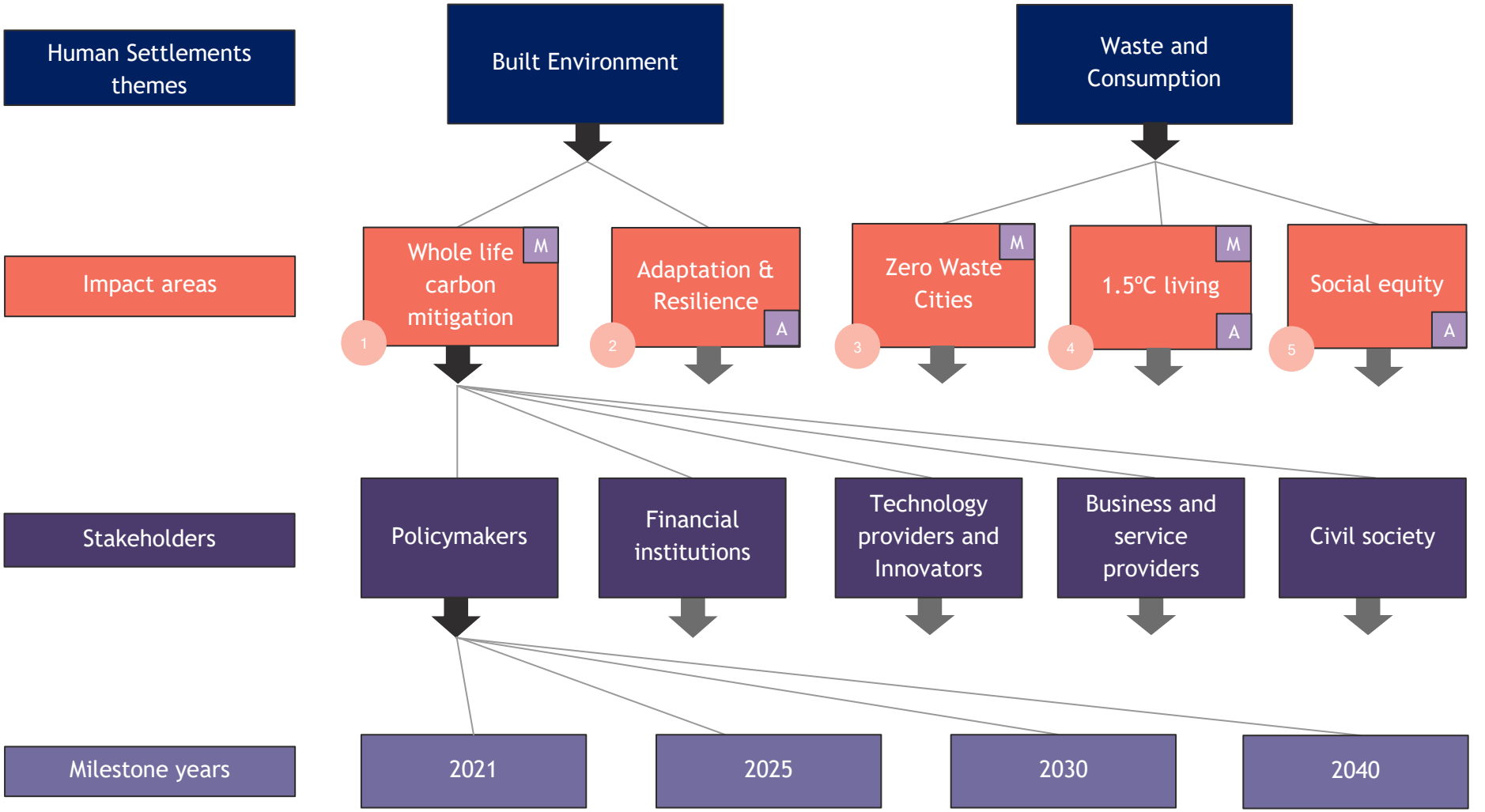
[1] For a deeper analysis of the sector, the GlobalABC Regional Roadmaps for Buildings and Construction bring a set of policy and technology targets and timelines that can support regions, countries and cities in developing their own tailored strategy for decarbonizing the built environment.

3. Develop knowledge and capabilities in financial engineering and provide technical assistance and earmarked resources to support expert project preparation within LRGs. For example, create domestic hubs of financial expertise ("FinHubs") for local climate action financing, and mechanisms for guarantees and credit enhancement for local projects.
4. Strengthen domestic financial intermediaries, such as subnational development banks, to act as domestic entry points for channelling subnational climate financing to local and regional projects.

These actions[2] can be embedded in an overarching call for a "Global Action Framework for Localizing Climate Finance" that would guide national governments and other partners in supporting LRGs in taking local climate action. These actions will be included in the Marrakech Partnership Finance Pathway[3] when released.

[2] See the references in the "further references" section below the action tables of each impact area for more information on these actions.
[3] The Marrakech Partnership Finance Pathway will be launched in 2021.

HUMAN SETTLEMENTS STRUCTURE



BUILT ENVIRONMENT CHANGE LEVERS

Action and collaboration are needed immediately from all stakeholders to achieve the paradigm shift to a net-zero and resilient built environment. If action is not taken today, we risk locking emissions and vulnerability into our buildings and infrastructure that will become increasingly costly to mitigate in the future.

To decarbonize the built environment, whole-life carbon emissions (operational and embodied) must be assessed and tracked on all new and existing developments to determine how best to minimize emissions while ensuring resilience for the future. System decarbonization requires demanding less material, minimizing energy use, and implementing low-carbon and renewable heating, cooling, material and construction technologies at scale, while promoting the decarbonization of the energy, transportation, and material manufacturing sectors (e.g. steel and cement) in parallel. These sectors have their own themes and respective pathways in the Marrakech Partnership structure. The interventions needed to reach net zero will vary from project to project and can range from using ultra-low-impact refrigerants for cooling (see cooling pathway), implementing passive design measures, installing electric building energy systems powered by renewables, and reusing existing materials.

The built environment has great inertia due to its complexity and fragmented value chain. In addition to the need for individual stakeholders implementing the actions presented in this document, radical collaboration across all stakeholders at the project and sector scales is needed to find solutions that will transform it. The supply chain must align around zero-carbon solutions and work in collaboration to deliver them. Many of these solutions already exist, but finance and policy intervention are needed to support their implementation.

Policymakers

In most countries, policies that regulate or drive net-zero carbon solutions in the built environment are severely lacking. More than two thirds of the buildings constructed between now and 2050 are expected to be built in countries that do not have any building energy codes. All countries need to include specific measures in their nationally determined contributions (NDCs), introduce or strengthen building codes, and implement

policies that enable the creation of appropriate financial instruments and incentives, while upskilling the workforce, to drive down emissions and embed resilience in buildings and infrastructure. By sending strong policy signals, governments level the playing field and accelerate decarbonization in this sector. Progressive emission targets and regulations must be based on real operational performance and construction emissions from assets, and deep energy retrofit must be increased and incentivized. Countries, cities and regions need to undertake comprehensive risk and vulnerability mapping to support resilience strategies which ensure the adaptation of existing built assets and the integration of resilience measures into all new construction. Local governments must also implement planning policy that prioritizes reuse and refurbishment of existing assets, avoids demolition, and ensures that any new development provides high social value, embeds resilience and minimizes whole-life carbon as standard practice.

Financial institutions

In finance, investors are beginning to realize the value of low-carbon and resilient assets as they are less risky. However, this growing interest has not yet filtered into the project delivery chain. Investors must advocate for government action through policy and regulation, which are needed to make the transition to net-zero investible. In the meantime, financial institutions must set investment criteria based on whole-life carbon emissions and resilience, invest in low-carbon technologies to bring them to scale, and create financial mechanisms that stimulate demand for energy-efficient retrofit and net-zero carbon buildings. Maximizing the value of existing assets, materials and products in the built environment through reuse and refurbishment as part of a circular economy presents great emission reduction and investment potential that the financial market should capitalize on.

Technology providers and innovators

Technology providers and innovators have a crucial role to play in enabling the transformation of the built environment. The products, systems, business models and techniques they develop and bring to scale, whether a new application of an existing technology or something entirely new, will impact the effectiveness of the actions taken by all other stakeholders. Digital solutions will be a key part of driving decarbonization through enabling other stakeholders to minimize emissions and embed resilience, for example by enabling the reporting of as-built embodied carbon

from construction projects and real-time tracking and automated optimization of operational building performance. They must work closely with all stakeholders in the project value chain to ensure that their innovations and technologies are implementable and address any barriers to decarbonization and embedding resilience.

Business and service providers

Businesses have a growing desire and awareness of the need to shift to a net-zero built environment. Business-led initiatives to push this agenda forward are growing in size and number, yet many businesses are risk-averse, which can prevent them from leading change and innovating. Support from finance and policy is needed to mitigate financial risk and provide incentives to accelerate the transformation that businesses are capable of delivering. In the meantime, businesses must demand zero-carbon buildings, invest in low-carbon technologies, influence collaborators, advocate for policy, upskill their workforce in low-carbon construction, assess, minimize and track emissions, and embrace circular economy principles on all projects. As an immediate step, businesses must commit to achieving net zero across their activities, supported by clear targets and transparent progress-reporting, and collaborate across all the sectors of the built environment to achieve system transformation.

Civil society

In civil society, all individuals must be educated on the contribution of the operational emissions from buildings they use to their carbon footprint, what behaviours they can change to reduce this, and what the associated financial and well-being co-benefits are if such behaviour changes are adopted at scale. These changes in behaviour need to penetrate all sectors that service society, such as healthcare and education, and could be achieved by tracking and displaying live operational carbon emissions and cost performance (e.g. using smart meters). Minimizing demand on energy and water in buildings must become the new daily normal, and those who can must demand electrification and low-carbon, deep energy-efficiency retrofit of their existing buildings. The media can help educate and shift citizens' mindset by highlighting the adverse impacts of not making these habitual changes.

BUILT ENVIRONMENT SYSTEM TRANSFORMATION MAP

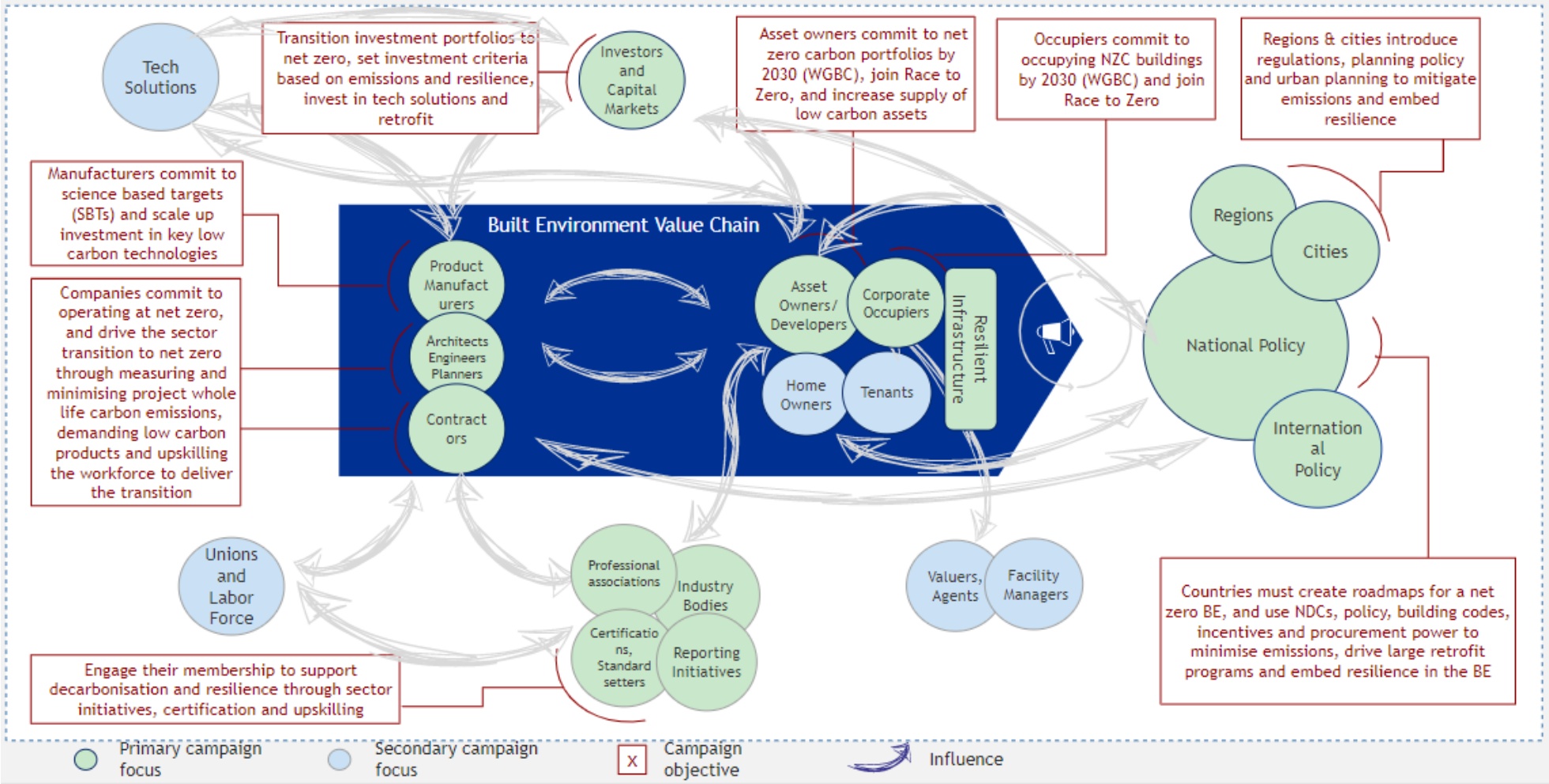
Currently the buildings and construction sector accounts for almost 40 per cent of global energy and process-related carbon emissions.[4] According to the Intergovernmental Panel on Climate Change (IPCC) special report on *Global Warming of 1.5°C*, restricting climate change to 1.5°C would need "rapid and far-reaching" changes around energy use, industry and buildings design, as well as the wider planning of cities and infrastructure. The built environment must also be resilient, as by 2050, over 970 cities could be subjected to extreme heat, 500 cities could suffer from lack of water availability, and over 570 cities could be impacted by sea-level rise.[5] In the face of this, around 40 per cent of buildings[6] and 75 per cent of infrastructure[7] that are predicted to exist in 2050 have yet to be built, and the built assets that already exist require retrofit to bring them to net-zero standards. System transformation is needed to decarbonize and make the built environment resilient to avoid these effects.

Built environment actors are galvanizing around the following overarching decarbonization objectives:

- By **2030**, 100 per cent of new buildings must be net-zero carbon in operation, with widespread energy efficiency retrofit of existing assets well underway, and embodied carbon must be reduced by at least 40 per cent, with leading projects achieving at least 50 per cent reductions in embodied carbon.
- By **2050**, all new and existing assets must be net zero across the whole life cycle, including operational and embodied emissions.

The systems transformation map below shows the key stakeholder groups in the built environment, how they influence each other, and proposed goals in order to achieve the overarching objectives above. The stakeholder actions required to meet these goals are included in the action tables in impact areas 1 and 2 in the following section.

[4] Global Alliance for Buildings and Construction (GlobalABC). 2019. Global Status Report for Buildings and Construction
[5] C40 Cities. 2018. The Future We Don't Want
[6] Carbon Trust. 2009. Building the future, today
[7] Global Infrastructure Basel. 2014. 4th Summit Report


Tech Solutions
Transition investment portfolios to net zero, set investment criteria based on emissions and resilience, invest in tech solutions and retrofit
Investors and Capital Markets
Asset owners commit to net zero carbon portfolios by 2030 (WGBC), join Race to Zero, and increase supply of low carbon assets
Occupiers commit to occupying NZC buildings by 2030 (WGBC) and join Race to Zero
Regions & cities introduce regulations, planning policy and urban planning to mitigate emissions and embed resilience
Manufacturers commit to science based targets (SBTs) and scale up investment in key low carbon technologies
Built Environment Value Chain
Product Manufacturers
Architects Engineers Planners
Contractors
Companies commit to operating at net zero, and drive the sector transition to net zero through measuring and minimising project whole life carbon emissions, demanding low carbon products and upskilling the workforce to deliver the transition
Asset Owners/ Developers
Corporate Occupiers
Home Owners
Tenants
Resilient Infrastructure
Regions
Cities
National Policy
International Policy
Unions and Labor Force
Professional associations
Industry Bodies
Certifications, Standard setters
Reporting Initiatives
Valuers, Agents
Facility Managers
Engage their membership to support decarbonisation and resilience through sector initiatives, certification and upskilling
Countries must create roadmaps for a net zero BE, and use NDCs, policy, building codes, incentives and procurement power to minimise emissions, drive large retrofit programs and embed resilience in the BE
Primary campaign focus
Secondary campaign focus
X
Campaign objective
Influence

BUILT ENVIRONMENT

BE.1 WHOLE LIFE CARBON MITIGATION

Impact 1

BUILT ENVIRONMENT – WHOLE-LIFE CARBON MITIGATION

MITIGATION

NEXUS

	By 2021	By 2025	By 2030	By 2040
Policymakers (national, subnational, local				

levels) **ACTIONS:** Include specific measures to address the emissions from the Built Environment in NDCs	• Countries enhance their NDCs and ensure they are compatible with a 1.5-degree pathway, specifically addressing built environment emissions and target net zero across the lifecycle of all projects by 2050. • Governments ensure that local and subnational climate actions are clearly incorporated into NDCs and national action plans	• Countries revise their NDCs, further extending the scope and ambition of actions to decarbonise the built environment across the lifecycle • NDCs cover 100% of the emissions from the built environment • Countries put in place measurement, reporting and verification (MRV) mechanisms, identifying baselines to track progress in NDC implementation	• Countries revise their NDCs, increasing the scope and ambition of actions to decarbonise the built environment across the lifecycle • Countries continuously track progress through MRV processes, addressing gaps in implementation and raising ambition where possible.	• Countries revise their NDCs, increasing the scope and ambition of actions to decarbonise the built environment across the lifecycle that aligns with reaching a net zero built environment by 2050 at the very latest.
Establish roadmaps for a net zero built environment and develop supporting policies and targets	• Leading countries, cities and regions have a comprehensive net zero carbon roadmap for the built environment, with a clear policy trajectory in place addressing operational and embodied emissions over the whole life cycle.	• The biggest emitting countries, cities and regions have a comprehensive net zero carbon roadmap for the built environment, with a clear policy trajectory in place addressing operational and embodied emissions over the whole life cycle. • Implement policies and progressive operational emissions targets based on performance data that	• All countries, cities and regions have a comprehensive net zero carbon roadmap for the built environment, with a clear policy trajectory in place addressing operational and embodied emissions.	• All countries, cities and regions review and revise their roadmaps to ensure alignment with achieving a net zero built environment by 2050. • Policies and targets are in place that specify all new and existing assets must be net zero across the whole life cycle, including operational and embodied emissions.

		specify all new buildings must be net zero in operation by 2030. • Implement policies and progressive embodied carbon targets, based on collected data, to have at least 40% less embodied carbon in infrastructure, building and renovation projects by 2030.		
Develop and implement mandatory building codes that reduce both operational and embodied emissions	• Countries, especially high growth countries, introduce or strengthen building energy codes. • Countries, especially high growth countries, introduce building codes that address material efficiency and embodied carbon. • Put in place a building code improvement cycle that strengthens the performance requirements every three to five years.	• All countries have in place performance-based building energy codes for all new and existing buildings that require all new buildings to operate at net zero carbon and retrofits to be net zero carbon ready. • All countries have building codes that include requirements to increase material efficiency and achieve embodied carbon reductions of 40%. • Governments have tools or mechanisms to easily assess compliance with building codes.	• Building codes are improved with more stringent requirements for whole life carbon emissions.	• All countries have in place buildings codes addressing emissions across the lifecycle that align with the target for all buildings and infrastructure to be net zero by 2050.
Mandate life cycle assessment (LCA) on during design and construction to minimise whole	• Leading cities, regional and/or national governments implement	• All cities, regional and/or national governments implement planning policy,	• Governments partner with other stakeholders to ensure that national material embodied	

life carbon emissions of projects	planning policy that requires LCA during design and construction • Governments partner with other stakeholders to develop national embodied carbon factor databases and plan to for it to be periodically updated as more data becomes available. • Work with NGOs / industry coalitions to close key LCA information gaps and establish or confirm adoption of existing LCA methodology or standards.	or other mechanisms, that mandates LCA during design and construction • Governments partner with other stakeholders to ensure national embodied carbon factor databases cover the most widely used constriction products • Programs are in place to build capacity of the informal building sector to use LCA to minimise emissions • Set ambitious regulations on LCA for building projects based on circular economy principles.	carbon factor databases cover all constriction products. • Governments work with other stakeholders to update LCA standards if necessary • Governments reinforce implementation and regulation on LCA for building projects based on circular economy principles.	
Collect as-built embodied carbon emissions data and monitor operational carbon emissions to inform development of performance benchmarks	• Governments put in place programs to mandate reporting and disclosure of as-built embodied carbon emissions, energy performance and operational carbon emissions data. • Governments work with technology providers and businesses to set up embodied and operational emissions data collection infrastructure. • Governments partner with	• Governments mandate reporting and disclosure of as-built embodied emissions, energy performance and operational carbon emissions data. • Embodied and operational carbon data collection mechanisms are functional. • Governments promote widespread use of building passports to capture building information, such as materials and embodied	• Governments require that building passports are created for all new buildings. • All households in formal settlements have access to real time operational performance data • Update performance benchmarks based on the collected data.	• The collection of as-built embodied carbon data and in-use performance and operational carbon data from all buildings and infrastructure projects is automated.

	other stakeholders to develop performance benchmarks based on the collected data.	carbon. • Update performance benchmarks based on the collected data.		
Drive widespread deep energy retrofits aligned to net zero carbon standards	• Governments put in place regulatory frameworks that incentivize energy efficient retrofit aligned to net zero carbon standards • Governments create and promote national training programmes to upskill the existing workforce and create job opportunities in the retrofit of existing buildings to net zero carbon ready standards. • Governments commit to rapidly scaling up renovation rates, targeting at least 3% by 2030. • Governments prioritise energy efficiency in buildings as part of COVID-19 economic recovery plans	• Governments have in place comprehensive energy efficiency requirements for all major refurbishments and renovations • Governments have in place national incentives for large scale energy retrofit (commercial and residential) • Governments continue to scale up training programmes to upskill the existing workforce and create job opportunities in the retrofit of existing buildings to net zero carbon ready standards. • National, local and subnational governments have in place a set of fiscal and non-fiscal incentives to support SMEs, households, developers and operators in prioritizing renewable energy and electrification solutions for retrofit.	• Governments ensure that retrofit rates are at least 3%. • Governments update energy efficiency requirements for all major refurbishments and renovations.	• Governments increase retrofit rates and have plans in place to complete the retrofit of all existing buildings that are not net zero carbon ready.
Use urban planning to minimise resource (materials and energy)	• Develop frameworks to analyse what buildings and	• Implement planning policy that requires all existing		

use whilst meeting the needs and improving health and wellbeing of communities	infrastructure are needed to cater for a community • Local governments include district energy planning into urban planning and neighbourhood design.	buildings in a community to be highly utilised before new buildings are constructed. • Prioritise green infrastructure to serve both as amenity space and infrastructure for water management, minimising flood risk, and minimising hard landscaping to reduce demand for materials • Local governments establish embodied carbon standards at neighbourhood level.		
Implement policy to decarbonise energy supply	• *See the Energy pathway* • Develop a set of fiscal and non-fiscal incentives to support SMEs, households, developers and operators in prioritizing on-site renewable energy and electrification solutions for retrofit and new build.	• *See the Energy pathway* • National, local and subnational governments have in place a set of fiscal and non-fiscal incentives to support SMEs, households, developers and operators in prioritizing renewable energy and electrification solutions for retrofit and new build.	• *See the Energy pathway*	• *See the Energy pathway*
Implement policy to ratchet the energy performance standards of appliances	• *See the Cooling pathway* • Establish product performance ladders for appliances	• *See the Cooling pathway* • Widespread use of appliances with mandatory Minimum Energy Performance Standards (MEPS) and labelling.	• *See the Cooling pathway* • Widespread use of appliances with mandatory High Energy Performance Standards (HEPS) and labelling.	

		• Product performance ladders - labels-incentives' policies to drive GWP reduction alongside energy efficiency gains in place in largest cooling countries and regions (China, India, South East Asia, US, EU, MENA).		
Implement policy and use procurement power to drive demand for low embodied carbon / GWP and products and materials that fit into the circular economy	• *See the Industry Pathway for decarbonisation of steel, cement & concrete, plastic and aluminium production* • Governments adopt policies that promote holistic solutions to minimise impacts of construction materials based on circular economy principles. • New commitments from leading countries on accelerated uptake of ultra-low GWP refrigerants	• *See the Industry Pathway for decarbonisation of steel, cement & concrete, plastic and aluminium production* • Mandate Environmental Product Declarations (EPDs) and mandatory labelling systems for key materials and components	• *See the Industry Pathway for decarbonisation of steel, cement & concrete, plastic and aluminium production* • Mandate Environmental Product Declarations (EPDs) and mandatory labelling systems for all materials and components	• *See the Industry Pathway for decarbonisation of steel, cement & concrete, plastic and aluminium production*
Implement policy to drive the adoption of circular economy principles in the built environment	• Governments partner with other stakeholders to develop performance benchmarks and sector targets that include the use of materials with low-embodied carbon.	• National and local policies aligned and focused on circular economy principles • Fiscal incentives for material recovery and sustainable waste management in place	• Governments put in place mandatory design for assembly guidelines and implement mandatory construction waste reuse.	

		• Governments set national policy aimed at improving recycling and reprocessing systems • Governments set national policy that drives reuse and refurbishment in preference to demolition and new construction		
Governments lead by example by decarbonising municipal buildings and public projects across the life cycle	• Governments of leading nations, regions and cities commit to decarbonise municipal buildings and public projects in line with the targets set out in the 'built environment system transformation' section of this document, aiming to be ahead of the targets • Governments commit to piloting low-carbon scalable innovations to inspire wider uptake. • Governments set up large scale municipal building retrofit programs	• All governments commit to decarbonise municipal buildings and public projects in line with the targets set out in the 'built environment system transformation' section of this document, aiming to be ahead of the targets. • Governments are piloting low-carbon innovations on municipal buildings that will take the built environment to net zero carbon by 2050. • Governments have begun to execute large scale municipal building retrofit programs • Governments adopt low-carbon procurement policies that require high energy efficiency building systems, ultra-low GWP	• Governments increase the rate of retrofit of municipal buildings and public projects • Low-carbon procurement policies are revised to be made more stringent • Governments update whole life carbon targets for new public buildings, large public renovations and infrastructure.	• Governments further increase the rate of retrofit of municipal buildings and public projects • Low-carbon procurement policies are revised to be made more stringent • Governments update whole life carbon targets for new public buildings, large public renovations and infrastructure.

		refrigerants, and low-carbon materials, aligning with circular economy principles and meeting regional best practice environmental standards • All governments implement whole life carbon targets for new public buildings, large public renovations and infrastructure.		
Financial Institutions **ACTIONS:** Institutional investors commit to transition their investment portfolios to net zero by 2050 at the latest	• Commit to transition investment portfolios to net zero emissions by 2050 at the latest and align with relevant industry roadmaps • Commit to setting and publishing interim targets every 5 years	• Transparently disclose performance and progress against targets • Publish interim targets	• Monitor and increase ambition to accelerate the transition of investment portfolios towards net zero emissions by 2050. • Transparently disclose performance and progress against targets • Publish interim targets	
Institutional investors set net zero targets across whole life cycle for their real assets portfolios and disclose on progress	• Assess carbon and energy intensity of built environment assets using Carbon Risk Real Estate Monitor (CRREM) model or equivalent standard to	• Increase % of AUM that is invested in net zero or aligned assets • Transparently disclose transition plans and progress	• Increase % of AUM that is invested in net zero or aligned assets • Transparently disclose transition plans and progress • Progressively screen new	• Increase % of AUM that is invested in net zero or aligned assets • Transparently disclose transition plans and progress

	determine alignment with 1.5ºC pathway • Set targets for % assets under management (AUM) in net zero or net zero-aligned assets • Work with other stakeholders to set indicators for whole life cycle emissions. • Institutional investors engage with investee companies across the built environment value chain to set net zero targets by 2050 • Investors in companies across the built environment value chain require reporting as a condition of investment through industry initiatives and benchmarks such as GRESB, CDP and TCFD	• Screen new investments using the CRREM model or equivalent standard to assess alignment • Mainstream use of whole life cycle indicators for financial decisions. • Finance and investment institutions use circular economy principles as basis for funding and investment decisions.	investments using the CRREM model or equivalent standard to assess alignment • Only finance new projects and buildings that operate at net zero carbon and have reduced embodied carbon by 40%	• Progressively screen new investments using the CRREM model or equivalent standard to assess alignment • Only finance new buildings and infrastructure projects that are net zero across the lifecycle including operational and embodied emissions.
Institutional investors increase investment in climate solutions to support meeting net zero carbon targets	• Assess current allocation to climate solutions and set target to increase investment. • Increase investment in climate solutions such as renewable energy to grow the supply side of net zero solutions	• Increase investment in climate solutions such as renewable energy to grow the supply side of net zero solutions • Report on climate solutions allocation as % of AUM (aligning with EU taxonomy criteria)		

	• Work with the relevant stakeholders to understand the financial needs per sector and current barriers		
Channel and incentivise investment into energy efficient retrofits	• Develop Programme for Energy Efficiency in Buildings (PEEB) offering financing options for investment in energy efficiency • Finance institutions develop and launch new financial solutions that overcome the barriers faced in scaling up energy efficient retrofits • Finance institutions provide long-term capital for retrofit projects through Property Assessed Clean Energy (PACE) financing • Incentivise the retrofit of buildings through providing green mortgages which offer a lower interest rate, or an increased loan amount tied to improving energy efficiency.	• Finance institutions put in place finance mechanism to pool large scale retrofit programs. • Finance institutions put in place financing mechanisms that facilitate and incentive the uptake of renewable energy generation/ clean energy solutions in buildings • Governments and finance institutions collaborate for wide-spread PACE financing.	• Finance institutions include energy efficiency criteria in all refurbishment efforts • Finance institutions include energy efficiency criteria in all buildings-related loans
Governments and International Financial Institutions support the	• Bilateral/multilateral development country	• National, subnational and local governments as well	• SDBs are systematised entry points for enhancing

transition to net zero	assistance strategies include operational carbon mitigation component • Upgrading of Subnational Development Banks (SDBs) to act as intermediaries and support institutions to subnational access to climate financing: The Global Alliance for SDBs sets its roadmap for action in different continents and creates momentum for better integration in the "glocal" climate finance value chain and channelling by 2021. • Public finance institutions put in place financial incentives for green zoning and energy efficiency performance standards, as well as district energy considerations	as finance institutions include and earmark specific budgets on local and subnational climate action planning and implementation by 2025. • Governments and finance institutions dedicate financing for guarantees and credit enhancement mechanisms for local and subnational climate action projects by 2025. • SDBs produce expert data on subnational climate finance fluxes and play a key role in the resilience of the financing cycle of local net zero projects/action plans. • Governments create and support domestic climate finance expertise hubs ("FinHubs") offering local governments the adapted professional advisory support to climate-compliant project preparation and deal closing, and connecting local and regional governments to existing project preparation facilities and initiatives, and technical assistance supply,	subnational climate financing to local projects - The Global Alliance for SDBs has allowed to build solid domestic pipelines of projects and have expanded the market segment for subnational climate financing for both public and private investors, at both domestic and international levels by 2030. • Finance expertise hubs "FinHubs" have enhanced significantly the quality of projects presented to public and private investors and initiated a complete renewal of financial models, instruments and solutions available on the market by 2030.

	including for local financial engineering innovation			
Technology Providers and Innovators **ACTIONS:** Develop digital solutions to: a) accurately measure and automatically optimise built asset operational performance in real time; and b) Measure and freely share as-built embodied carbon emissions over the asset life cycle	• Make building management systems available and affordable in parts of the world where they are not currently used to track buildings energy and emissions performance. • Work with material manufacturers, suppliers and contractors to develop solutions that enable the accurate tracking of real product supply chain emissions due to manufacture, transportation and installation on site. • Make tools available that facilitate a standardised approach to embodied carbon measurement at the product and asset level	• Ensure that real embodied and operational carbon measurement solutions exist that are scalable in all parts of the world and tailored to the regional context. • Carbon emissions database technology is ready to be implemented in all countries around the world. This must be coordinated with the needs of businesses, policymakers and the finance community. • Supply chain emissions tracking solutions are available for materials that are most widely used and contribute most to global warming (steel, concrete, timber, glass, aluminium)	• All tools that estimate carbon emissions used in project design stages are informed by real emissions and supply chain behaviour data, where appropriate. • Supply chain emissions tracking is available for all products used on construction sites • All households around the world have access to real time monitoring of operational performance, e.g. through smart meters, so that they can manage their consumption.	• Ensure that all countries around the world have access to the solutions that allow for built environment carbon emissions to be tracked and feed into operational management and design, whilst informing policy and investment decisions.

	in all parts of the world. • Develop regional, national or international project carbon emissions databases to collect data from all new and existing projects	• All commercial buildings and infrastructure assets around the world must have access to real time monitoring of operational performance. • NGOs / networks / researchers Implement standardized embodied carbon calculation methods, design tools and guidance • NGOs / networks / researchers contribute to establishment of databases and help set benchmarks		
Develop low carbon construction processes and materials	• *See the Industry Pathway for decarbonisation of steel, cement & concrete, plastic and aluminium production* • Research institutions increase R&D on scalable, locally adapted, low carbon construction solutions that implement circular economy principles • Prioritise R&D focused on developing and scaling solutions for material processing and reuse, reducing demand for new	• *See the Industry Pathway for decarbonisation of steel, cement & concrete, plastic and aluminium production* • Design and construction methods for optimizing material use and prioritising low-carbon material • All research institutions with programmes looking at solutions from the built environment	• *See the Industry Pathway for decarbonisation of steel, cement & concrete, plastic and aluminium production* • Development of low-carbon local alternatives for materials and techniques with preference for use local materials rather than imports when appropriate	• All electricity used in manufacturing is from renewable or low carbon sources • All forms of energy used are from renewable or low carbon sources and all process carbon emissions are mitigated. • All refrigerants are ultra-low GWP

	materials • Prioritise R&D focused on reducing the embodied carbon footprint of key components of the built environment			
Develop energy efficient and clean energy solutions for the built environment	• *See Energy Pathway* • Research institutions increase R&D on scalable locally adapted solutions for low operational carbon assets • Innovators prioritise R&D on zero-emissions and energy-positive buildings in developing countries • R&D in energy efficiency (e.g. building design), and clean energy solutions including district energy, microgrid, smart grid and district energy solutions. • Technology providers engage in R&D urban planning solutions that deliver high energy efficiency.	• *See Energy Pathway* • Technology providers make available automation and machine learning capabilities to efficiently balance energy supply and demand through smart grids. • Ensure affordable energy storage solutions are available at all scales of renewable energy generation (household, community, city and regional) • Passive and hybrid strategies identified for all bioclimatic regions and specific building types, with considerations for shading, windows, insulation, lighting, among others • Adoption of Building Management Systems and Energy Management Systems to improve the overall management of the	• *See Energy Pathway*	• *See Energy Pathway*

		building system controls.	
Enabling low carbon operation and maintenance of built assets		• Technology and innovation providers put in place product-service systems approach for buildings. • Develop ways of feeding real asset operational performance data and as-built embodied carbon data into design tools.	• Develop biomass and waste heat recovery strategies, electrification of processes, switch to cleaner fuels including hydrogen
Business and Service Providers **ACTIONS:** Businesses across the built environment value chain commit to net zero and decarbonise assets under their control	• Businesses set net zero commitments, and sign up to relevant industry commitments (e.g. World Green Building Council's Net Zero Carbon Buildings Commitment and the Science Based Targets initiative), supported by roadmaps and targets • Businesses track and report energy and carbon emissions performance of assets under their control. • Businesses commit to	• All Green Building Councils / NGOs certification schemes include net zero operational and embodied carbon requirements • Transparently disclose performance and progress against targets • Publish interim targets	• Transparently disclose performance and progress against targets • Publish interim targets

	voluntary reporting initiatives.			
Corporate occupiers decarbonise the buildings they occupy collaborating with building owners	• Companies assess the buildings they occupy and identify opportunities to decarbonise the buildings, working with the building owners. • Companies implement green lease clauses with building owners.	• Corporate occupiers advocate for or set procurement standards for low/ net zero carbon buildings to drive market demand. • Corporate occupiers advocate for and set procurement standards for low embodied carbon/ circular buildings to drive market demand.	• Companies require all new buildings they occupy to be net zero carbon in operation and have at least 40% embodied carbon.	
Developers, architects, engineers, contractors and asset managers/owners assess, minimise and report project emissions through design, construction, and use, prioritising emissions released before 2050	• Asset developers show leadership by setting project briefs that demand net zero carbon buildings and infrastructure • All businesses influence project collaborators to prioritise minimising carbon emissions on projects • Developers and architects promote business models focused on zero-emission buildings. • Voluntary benchmarking systems with certification are in place for commercial typologies tracking performance and	• Businesses and governments collaborate to implement building passports for all buildings. • All developers set embodied carbon reduction targets • Design companies propose best practice embodied carbon reduction targets and implement circularity principles • All design companies publicly share lifecycle assessment data • Infrastructure providers adopt business models for low-carbon infrastructure.	• All construction sites are highly resource and energy efficient and, along with site-related transport processes, are powered by renewable energy • Design companies propose requirements for all projects to be 100% net zero embodied carbon • All project teams contribute their embodied carbon data at the end of the design stage, and at the end of the construction stage	• Developers only build projects that have net zero embodied carbon

	comparing that performance with other buildings • Private sector prioritise energy efficiency and renewable energy when developing neighbourhoods • All designers commit to relevant industry roadmaps and have integrated low embodied carbon design at conceptual design stage • Businesses set standards for new developments prioritizing high levels of energy efficiency/ clean energy use. • All developers commit to relevant industry roadmaps and require disclosure of supply chain data for structural elements	• All developers require mandatory disclosure of supply chain data and track construction site emissions		
All businesses across the value chain collaborate to develop new viable, low carbon solutions for buildings and infrastructure	• *See Industry Pathway* • All manufacturers and suppliers commit to relevant industry roadmaps and have developed carbon reduction targets and with timelines set to achieve net	• *See Industry Pathway* • Manufacturers work with the rest of the delivery chain to	• *See Industry Pathway* • All manufacturers have declared their entire standard product portfolios via EPDs	• *See Industry Pathway*

	zero embodied carbon by 2050.		
Developers, architects, engineers, and contractors demand better environmental practice and lower carbon technologies and innovations from the supply chain	• Demand EPDs for key products used on projects • Require that companies supplying products have a roadmap in place to reach net zero by 2050 in line with a 1.5 degrees global warming scenario	• Commit to including requirements in specifications for suppliers to produce EPDs for all products used on a project. • Include carbon caps on products included in specifications	• Include carbon caps on products included in specifications
Develop skills to enable the transition to a net zero built environment	• Create training courses on calculating and minimising carbon emissions on projects • Leading companies to make this training course mandatory for all employees • Contractors and builders to develop systems to improve skills in retrofitting ad refurbishing existing buildings • Embodied and operational carbon emissions measurement and minimisation are a core part of every built environment-related university course	• Make training courses mandatory for all employees • Provide training on implementation of circular economy principles • Embodied and operational carbon emissions are a core part of every built environment-related course • A key criterion of professional qualification with all built environment institutions is an awareness and ability to address carbon emissions	
Civil society	• Citizens minimise demand for energy in all buildings		

ACTIONS:

Citizens change behaviour to minimise operational emissions from domestic and non-domestic buildings

they use, at home, at work and in leisure

- Homeowners take advantage of government schemes to encourage energy efficient retrofit of homes
- Households shift to clean energy providers.
- Citizens purchase appliances with high energy efficiency ratings)

EXISTING INITIATIVES

Race to Zero	Race To Zero is a global campaign to rally leadership and support from businesses, cities, regions, investors for a healthy, resilient, zero carbon recovery that prevents future threats, creates decent jobs, and unlocks inclusive, sustainable growth. All members are committed to the same overarching goal: achieving net zero emissions by 2050 at the very latest. The objective is to build momentum around the shift to a decarbonized economy ahead of COP26, where governments must strengthen their contributions to the Paris Agreement. This will send governments a resounding signal that business, cities, regions and investors are united in meeting the Paris goals and creating a more inclusive and resilient economy. It aggregates net zero commitments from a range of leading networks and initiatives across the climate action community. These networks and initiatives define the substantive criteria that businesses, cities, states and regions, investors, universities, and others setting net zero targets are required to meet.
GlobalABC – Regional Roadmaps	The GlobalABC Regional Roadmaps for Buildings and Construction are a product of a highly consultative process, we had more than 700 experts engaged in the development process, refining them each time with more data and examples from the region. It presents policy and technology targets and timelines, as well as key actions under eight priority areas which range from urban planning to new buildings, building retrofits, building operations, systems, materials, resilience and clean energy, in the quest of harnessing

	the sector's enormous opportunities for decarbonization and achieving the sustainable development goals These roadmaps present both, a framework and a process that can be used at the national level and support the buildings and construction sector's Race to Zero by 2050.
C40 – Net Zero Buildings Declaration	The Declaration highlights buildings' importance for climate change mitigation and for meeting the goals set out by the Paris Agreement on climate change. It flags that buildings, on average, account for roughly half of cities' total greenhouse gas (GHG) emissions, and that "half a million people die each year due to outdoor air pollution caused by energy used in buildings." Mayors from 19 cities around the world have signed the Net Zero Carbon Buildings Declaration developed with the C40 Cities network. Signatories undertake to ensure that new buildings will operate at net zero carbon by 2030, and pledge that all buildings will operate at net zero carbon by 2050.
WorldGBC – Net Zero Carbon Buildings Commitment	The Net Zero Carbon Buildings Commitment (the Commitment) challenges business, organisations, cities, states and regions to reach net zero carbon in operation for all assets under their direct control by 2030, and to advocate for all buildings to be net zero carbon in operation by 2050. By setting ambitious 'absolute' targets, the Commitment aims to maximise the chances of limiting global warming to below 2 degrees, and ideally below 1.5 degrees, by drastically reducing operational carbon from buildings. The Commitment provides a framework to develop globally ambitious yet locally relevant, flexible and universally viable solutions for buildings within their portfolio, city, state or regional boundary. It sets actions to reduce energy demand and achieve net zero carbon through renewable energy and offsets (as a last resort). For businesses, the Commitment is one of three pathways available to join EP100.
EP100	EP100 brings together a growing group of energy-smart companies improving their energy productivity to lower their emissions and improve their competitiveness. EP100 is led by the Climate Group in partnership with the Alliance to Save Energy. Their mission is to lower global energy demand and accelerate the clean energy transition. By integrating ambitious energy targets into business strategy, leading companies are driving innovation in energy efficiency and increasing competitiveness while delivering on emissions reduction goals. Commitments: Double energy productivity, Implement an energy management system, Net zero carbon buildings (ref WGBC).
Mission 2020	Mission 2020 team is an extended network of individuals from organizations around the world who have taken the Mission on as their own. This extensive network is continuously growing, with people contributing every day to the descent of global emissions by 2020. In support of this ever-growing team, Mission 2020 is coordinated by a group of experienced diplomats, campaigners and strategists from around the globe, working across the six milestone areas to help deliver immediate breakthroughs on

	emissions reductions. One of the Missions focus on buildings and infrastructure.
C40 – Clean Construction Declaration	The Clean Construction Forum Declaration is a pledge to bring together and inspire stakeholders to take action, and enact policies and regulations where cities have the powers to: reduce embodied emissions by at least 50% for all new buildings and major retrofits by 2030, striving for at least 30% by 2025; Reduce embodied emissions by at least 50% of all infrastructure projects by 2030, striving for at least 30% by 2025; Procure and, when possible, use only zero emission construction machinery from 2025 and require zero emission construction sites city-wide by 2030.
Construction Declares Climate and Biodiversity Emergency	Construction Declares is a global petition uniting all strands of construction and the built environment. It is both a public declaration of our planet's environmental crises and a commitment to take positive action in response to climate breakdown and biodiversity collapse. Since May 2019, over 6000 Structural, Civil and Building Services Engineering practices, Landscape Architects, Contractors and Project Managers in over 25 countries across all continents have committed to the declaration.
International Coalition for Sustainable Infrastructure (ICSI)	ICSI's mission is to mobilize an engineering-led coalition to make resilience and sustainability a cornerstone of every decision in the infrastructure lifecycle in every community around the globe. ICSI will identify and address the biggest barriers to action that have prevented us from working together for a sustainable, resilient and inclusive future. Their action tracks focus on funding and financing, innovation, leadership and whole-of-life costs, and guidance, tools and standards.
Mission Innovation	Mission Innovation is a global initiative working to accelerate clean energy innovation. Mission Innovation has a series of Innovation Challenges (ICs) that are global calls to action aimed at accelerating research, development and demonstration (RD&D) in technology areas that could provide significant benefits in reducing greenhouse gas emissions, increasing energy security and creating new opportunities for clean economic growth.
Rocky Mountain Institute – Pathways to Zero	RMI is driving early movers in the buildings industry on a path to—or beyond—net zero energy by working with individual buildings, districts, cities, and portfolios to significantly reduce energy use, and powering them with renewable energy sources cost-effectively while also supporting dynamic grid interface. We're doing this by helping owners "lead by example," with pioneering demonstration projects that show net zero can be achieved profitably and uncover new sources of value, while also publishing key insights that were learned through these projects so others are inspired and activated to follow suit.

Programme for Energy Efficiency in Buildings (PEEB)	PEEB aims to significantly transform the building sector by promoting sustainable building design and construction. PEEB combines financing for energy efficiency in large-scale projects with technical assistance through policy advice and expertise for building sector professionals. PEEB is catalysed by the Global Alliance for Buildings and Construction (GABC). PEEB was initiated by the governments of France and Germany at COP22, and combines the expertise of its implementing agencies Agence Française de Développement (AFD), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and Agence de l'Environnement et de la Maitrise de l'Energie (ADEME). PEEB is working with its first five partner countries Mexico, Morocco, Senegal, Tunisia and Vietnam.
Super-efficient Equipment & Appliance Deployment (SEAD)	SEAD partners are working to create a common technical foundation to allow governments to more easily adopt cost-effective appliance efficiency policies and programs. Broader market transformation efforts—including incentives, awards, and procurement programs—seek to further accelerate the global pace of progress for energy-efficient equipment and appliances. Activities include: Increase partner participation and engagement; Highlight the benefits and urgency of energy-efficient equipment and appliance policies among participating governments; Increase awareness.
FMDV – Global Alliance for Subnational Development Banks (SDBs)	SDBs are national public stakeholders with the mandate to provide financial services to local governments. The Global Alliance is a multi-stakeholder coalition of SDBs and Central governments and development partners for professional intermediated access to climate finance for Local and Regional Governments, led by Cameroon, RIAFCO (the African Alliance of Subnational Development Banks) and FMDV – LUCI initiative.
UNCDF/UCLG/FMDV – International Municipal Investment Fund (IMIF) and Technical Assistance Facility (TAF)	An end-to-end project preparation facility (TAF) to support local governments to build their capacity, create an enabling policy environment to attract investment capital, and to generate a pipeline of revenue generating investments that will be financed by the IMIF, independently managed by Meridiam.
FMDV – Projects coaching and Matchmaking Forums to connect local projects with potential investors	Strengthen access to funding for local governments through city to city cooperation and projects coaching, connect the demand side for projects lead by central and local governments on sustainable urban services and infrastructure with the supply side for technical and financial solutions from DFIs, investors and service providers.
FMDV – Living Labs to test pilot and demonstrate low carbon solution	Development of small-scale innovation to test the technical, economics and financial models to evaluate and prepare the scale up investment phase. It lowers the investment risks, attract potential investors and ensure the appropriation by the local authorities and the final users.

FURTHER REFERENCES

Intergovernmental Panel on Climate Change (IPCC) – Special Report: Global Warming of 1.5°C	IOPD/UCLG/ENDA/FMDV/Kota Kita – Contributions of Participatory Budgeting to climate change, adaptation and mitigation
WGBC – Bringing Embodied Carbon Upfront	GlobalABC – Regional Roadmaps for Buildings and Construction (Africa | Asia | Latin America)
WBCSD – Scaling the Circular Built Environment: pathways for business and government	GlobalABC – Adopting Decarbonization Policies for Buildings and Construction
C40, Arup and University of Leeds – In-focus report on Buildings and Infrastructure	GlobalABC – A Guide to Incorporating Buildings Action in NDCs
C40 – Clean Construction Policy Explorer	International Resource Panel – Resource Efficiency and Climate Change Material: Efficiency Strategies for a Low-Carbon Future
United Nations Environment Programme (UNEP) – Emission Gap Report 2019	FMDV/COMSSA – The City Climate Finance Landscape in Sub-Saharan Africa
WBCSD – Building System Carbon Framework	FMDV/AFD – The Potential Catalytic Role of Subnational Pooled Financing Mechanisms

International Finance Corporation (IFC) – Green Buildings: A Finance and Policy Blueprint for Emerging Markets	International Energy Agency (IEA) – The Critical Role of Buildings

BE.2 ADAPTATION & RESILIENCE

Impact 2

BUILT ENVIRONMENT - ADAPTATION & RESILIENCE

ADAPTATION & RESILIENCE

NEXUS

	By 2021	By 2025	By 2030	By 2040
Policymakers (national, subnational, local levels)	• Local governments undertake inventory of current state of city infrastructure identifying weak spots/high-impact areas for resilience and climate mitigation and opportunities for cross-sectoral optimization. • Governments include funding needs for buildings water usage data collection and analysis	• Local governments undertake city-wide climate hazards and vulnerability assessment, which consider vulnerable populations. • Governments develop basic risk and vulnerability mapping and monitoring national and local strategy for resilience	• Local governments adopt early warning systems • All local governments include resilience measure in building codes. • Local governments prioritize nature-based solutions to reduce heat island effects and to increase resilience to extreme weather	

	included in annual budgets. • National and subnational governments develop long-term, integrated resilience plans and disclose these. • Local governments adopt policy to prioritize low- carbon, resilient ecodistricts approach for all new district development. • Cities put in place policy to consider resilience whenever undertaking renewal/upgrade/new developments in city infrastructure. • Governments have policy in place for use of vacant buildings for vulnerable groups.	• Governments establish urban design requirements that incorporate sustainable urban drainage systems and green zoning at neighbourhood level. • Cities adopt a cross-sectoral approach and jointly consider grey, green and blue infrastructure when undertaking renewal/upgrade/new developments in city infrastructure. • Governments have strategies in place for adaptation in most vulnerable buildings • Cities at high-risk location have resilience standards embedded to building codes • Local governments in high-risk areas include resilience in their building codes
Financial Institutions	• Finance institutions fund buildings water usage data collection and analysis. • Finance institutions make available capitalization and access to funding sources resilience and adaptation in human settlements. • Governments and national,	

	regional and international finance institutions have in place project preparation facilities focused on subnational infrastructure projects, with attention to early-stage project development and resilience assessment. • Investors embed TCFD recommendations and publicly disclose on their climate-related risks and opportunities • Investors actively engage with holdings to encourage management of climate-related risks; ensuring a resilient built environment • Bilateral/multilateral development country assistance strategies include resilience component		
Technology Providers and Innovators	• Tech providers coordinate with companies on release of buildings water usage data	• Technology providers engage in R&D into climate proof infrastructure above and below ground. • Technology providers engage in R&D into cross-sectoral approaches when upgrading/ renewing city infrastructure	• Technology providers work closely with civil society organizations to empower and scale community-based solutions.
Business and	• Private sector includes resilience considerations when developing neighbourhoods.	• Infrastructure providers adopt business models for resilient infrastructure.	• Businesses further incorporate resilience strategies in their business models and broaden

Service Providers	• Business work with governments adopting holistic, resilient urban planning business models considering green, blue, and grey infrastructure • Businesses embed TCFD recommendations and publicly disclose on their climate-related risks and opportunities.	• Private sector embarks upon effective reform of overarching frameworks and champions reforms towards minimum lot areas, maximum building heights, plot coverage ratios and land use restrictions, while safeguarding green space and avoiding the displacement of disadvantaged residents. • Businesses adopt resilient building and infrastructure standards and codes e.g. Reli 2.0 • Businesses focus in technology solutions for resilience in buildings, like building envelope efficiency and thermal comfort systems that can reduce the impact of extreme climatic conditions.	the scope to cover social resilience as well.
Civil society	• Communities collect and share expertise, lessons learned from local practice practices to support national resilience governance and strategy	• Communities get organized into community networks that promote further urban resilience, with better understanding and response to changing needs.	

EXISTING INITIATIVES

GlobalABC – Regional Roadmaps	The GlobalABC Regional Roadmaps for Buildings and Construction are a product of a highly consultative process, we had more than 700 experts engaged in the development process, refining them each time with more data and examples from the region. It presents policy and technology targets and timelines, as well as key actions under eight priority areas which range from urban planning to new buildings, building retrofits, building operations, systems, materials, resilience and clean energy, in the quest of harnessing the sector's enormous opportunities for decarbonization and achieving the sustainable development goals These roadmaps present both, a framework and a process that can be used at the national level and support the buildings and construction sector's Race to Zero by 2050.
International Coalition for Sustainable Infrastructure (ICSI)	ICSI's mission is to mobilize an engineering-led coalition to make resilience and sustainability a cornerstone of every decision in the infrastructure lifecycle in every community around the globe. ICSI will identify and address the biggest barriers to action that have prevented us from working together for a sustainable, resilient and inclusive future. Their action tracks focus on funding and financing, innovation, leadership and whole-of-life costs, and guidance, tools and standards.
The Resilience Shift	Resilience Shift exists to inspire and empower a global community to make the world safer through resilient infrastructure.
The Global Commission on Adaptation (GCA)	The GCA moves communities, cities and countries to proactively prepare for the disruptive effects of climate change with urgency, fierce determination and foresight, so we can take advantage of the best, most cost-effective options, reduce risk and come out stronger. Action Tracks include water, cities and infrastructure.
UN Habitat – Building Climate Resilience of the Urban Poor (BCRUP)	Aims to enhance the resilience of those living in slums and informal settlements in developing countries, targeting, by 2023, 150 million slum dwellers in 140 'hot-spot' cities across 50 countries, and scaling this up to reach 600 million slum dwellers by 2030. Partners in the Initiative aim to mobilize USD 15.2 billion over a first phase for 4 years
Asian Cities Climate Change Resilience Network (ACCCRN)	ACCCRN aims to enable poor, marginalized, and otherwise vulnerable people in Asia's emerging cities, to be included and supported in the systems and processes driving urbanization and emerging resilience-

	building measures. Objectives are to amplify local voices, facilitating collaboration among practitioners, supporting community initiatives for resilience, and connecting stakeholders to join hands in building urban resilience.
Closing the Investment Gap in Sustainable Infrastructure (CIG)	A country-led, facilitated approach in which developing countries work with the private sector and other investors in preparing their ''investment'' pitches and enhance their bankable projects. The approach targets a largely untapped pool of funds and minimises demand for public capital or credit enhancement.
Leadership of Urban Climate Investments (LUCI)	Aims to accelerate the scale-up and leverage climate finance for climate friendly urban infrastructure. committed to accelerate, scale-up and leverage finance for climate-friendly urban infrastructure, by: Strengthening the capacity of 2000 cities in project preparation by 2025. Linking 1000 climate smart urban infrastructure projects to finance by 2025. Enabling 100 climate smart urban infrastructure projects to successfully use new national and international financing mechanisms by 2025. Strengthening national framework conditions, including the capacity of National Development Banks (NDBs) to support urban infrastructure projects.
Global Alliance for Urban Crises	The Global Alliance for Urban Crises is a multi-disciplinary, collaborative community of practice working to prevent, prepare for and effectively respond to humanitarian crises in urban settings. Focus on ensuring that initiatives focused on building urban resilience incorporate components on resilient response and recovery from crises, and that they leverage greatest impact in cities most at risk of humanitarian emergencies.
Making Cities Resilient	Aim to support sustainable urban development by promoting resilience activities and increasing local level understanding of disaster risk. The objectives are to: 1. raise awareness of the benefits of reducing urban risks. 2. Invest wisely 3. Build more safely.
Global Facility for Disaster Reduction and Recovery (GFDRR)	The Building Regulation for Resilience Program develops and promotes activities to increase regulatory capacity and promote healthier and safer built environments. By leveraging good practice in building regulation as part of a strategy to reduce both chronic risk and disaster risk, it aims to set developing countries on the path to effective reform and long-term resilience.
Coalition for Urban Transitions	The Coalition for Urban Transitions is the leading global initiative helping national governments unlock the economic power of inclusive, zero-carbon cities. Aim to drive a shift away from business-as-usual by empowering national governments with the evidence-based rationale and policy tools they need to prioritise more compact, connected, clean urban development

Finance to Accelerate the Sustainable Transition-Infrastructure (FAST-Infra) initiative	HSBC has been working with the International Finance Corporation, the OECD and others to mobilise infrastructure investment in emerging markets, through our Finance to Accelerate the Sustainable Transition-Infrastructure (FAST-Infra) initiative. This aims to develop a consistent labelling system for sustainable infrastructure investment.
100 Resilient Cities	Helping cities around the world become more resilient to physical, social, and economic shocks and stresses. Cities in the 100RC network have been provided with the resources necessary to develop a roadmap to resilience along four main pathways: Financial and logistical guidance for establishing an innovative new position in city government, a Chief Resilience Officer, who will lead the city's resilience efforts; Development of a robust Resilience Strategy; Access to solutions, service providers, and partners from the private, public and NGO sectors who can help them develop and implement their Resilience Strategies; and Membership of a global network of member cities who can learn from and help each other.
Resilient Cities Network	Resilient Cities Network co-creates urban solutions to address complex and interrelated urban challenges, so that cities and communities thrive. It consists of cities that are committed to building and investing in urban resilience, located in five geographical regions: Africa, Asia Pacific, Europe and Middle East, Latin America and the Caribbean, and North America.
City Resilience Index	The City Resilience Index has been designed to enable cities to measure and monitor the multiple factors that contribute to their resilience. Structured around 4 dimensions: Health and wellbeing, Economy and society, Infrastructure and environment, Leadership and strategy
Global Real Estate Sustainability Benchmark (GRESB)	GRESB assesses and benchmarks the Environmental, Social and Governance (ESG) performance of real assets, providing standardized and validated data to the capital markets. The Resilience Module is an optional supplement and addresses transition and physical risk. It has both real estate and infrastructure assessments.
Resilience First for businesses	Resilience First provides strategic thinking and advocacy to improve business resilience. It helps business communities to better manage risk through partnerships and practical solutions.
Global Resilience Partnership	GRP is an inclusive and diverse Partnership of organisations joining forces towards a world where vulnerable people and places are able to thrive in the face of shocks, uncertainty and change. GRP achieves collective impact by adding value to the work of its individual partners through innovation and

	scaling, shared learning, convening diverse voices, and advancing knowledge. GRP is currently comprised of more than 60 organisations, which bring together a broad range of skills, capacities, and perspectives, and provides powerful collaboration opportunities.
City Resilience Program	The City Resilience Program (CRP) – a partnership between the World Bank and the Global Facility for Disaster Reduction and Recovery (GFDRR) – is a multi-donor initiative aimed at increasing financing for urban resilience. The CRP's vision is resilient cities with the capacity to plan for and mitigate adverse impacts of disasters and climate change, thus enabling them to save lives, reduce losses and unlock economic and social potential. The aim of the Program is to catalyze a shift from a primarily siloed, single-stream city-level resilience operations approach to longer term, more comprehensive, multi-disciplinary packages of technical and financial services, building the pipeline for viable projects at the city level that, in turn, build resilience.
FMDV – Global Alliance for Subnational Development Banks (SDBs)	SDBs are national public stakeholders with the mandate to provide financial services to local governments. The Global Alliance is a multi-stakeholder coalition of SDBs and Central governments and development partners for professional intermediated access to climate finance for Local and Regional Governments, led by Cameroon, RIAFCO (the African Alliance of Subnational Development Banks) and FMDV – LUCI initiative.
UNCDF/UCLG/FMDV – International Municipal Investment Fund (IMIF) and Technical Assistance Facility (TAF)	An end-to-end project preparation facility (TAF) to support local governments to build their capacity, create an enabling policy environment to attract investment capital, and to generate a pipeline of revenue generating investments that will be financed by the IMIF, independently managed by Meridiam.
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FMDV – Living Labs to test pilot and demonstrate low carbon solution	Development of small-scale innovation to test the technical, economics and financial models to evaluate and prepare the scale up investment phase. It lowers the investment risks, attract potential investors and ensure the appropriation by the local authorities and the final users.

FURTHER REFERENCES

Intergovernmental Panel on Climate Change, Special Report: Global Warming of 1.5°C	GlobalABC | Adopting Decarbonization Policies for Buildings and Construction
WBCSD - Construction and Building Materials TCFD Preparer Forum	CDP Report, Cities at Risk: Dealing with the pressures of climate change
GlobalABC Regional Roadmaps for Buildings and Construction (Africa | Asia | Latin America)	WBCSD: Business Climate Resilience: Thriving Through the Transformation
City Resilience Index	The Resilience Shift – Resilience Primers

WASTE AND CONSUMPTION CHANGE LEVERS

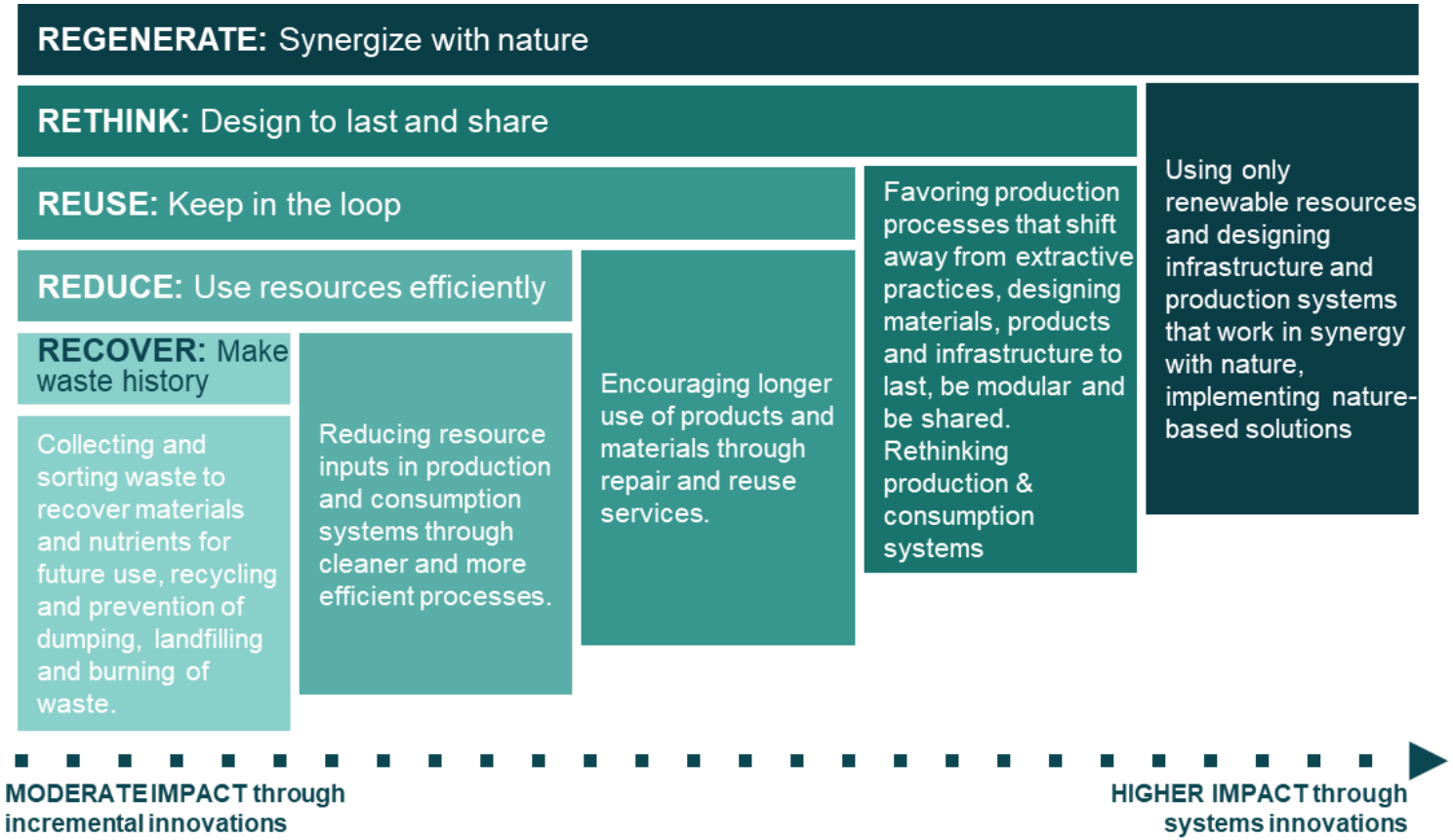
For shifting waste and consumption patterns, three impact areas are suggested: Zero-waste cities; 1.5°C living; and social equity.

Zero-waste cities

Cities that conserve all resources by means of responsible production, consumption, reuse and recovery of products, packaging, and materials without burning and with no discharges to land, water or air that threaten the environment or human health can be called zero-waste cities. There are a number of different critical moments where a zero-waste approach could comprehensively reduce the amount of GHG emissions being emitted and, therefore, reduce the volume of emissions that are the largest drivers of climate change worldwide. These critical stages include:

1. Extract – The stage when natural resources are extracted from the planet, for example, drilling for oil or gas, the production and manufacturing of crops in agriculture, sourcing timber for construction or the mining of minerals.
2. Process – Once extracted and sourced, these raw materials typically then undergo industrial processing so that they can be successfully adapted into modern commodities, such as producing metals from ores, plastic from oil, and cement from limestone.
3. Manufacture – Once these materials have been refined and processed, they can then be used explicitly for the production, manufacturing and assembly of everyday products that we use in modern society, ranging from large-scale construction of roads and houses to the production of fashion garments and food packaging.
4. Distribute – These finished products can, in turn, be used to provide services and access to products that satisfy the needs of modern society, such as communication services, retail, transport and many more needs which are embedded within the world we live in today.
5. Use – A zero-waste approach ensures that products and materials continue to retain their value and have a functional use within an economy that is circular. If products and materials cannot be reused, repaired or recycled, they will have a negative impact on our efforts to address and mitigate against climate change, by dispersing into the environment as unrecoverable waste or adding to GHG emissions.

For cities and municipalities wishing to reduce their impact on the environment and climate by transitioning to a more circular economy, regenerate, rethink, reuse, reduce and recover strategies can form the basis of a climate change mitigation plan at the local level.



Source: ICLEI Circular Development Pathway

1.5° Living

It is a commonly accepted fact that changes in consumption patterns and dominant lifestyles are a critical and integral part of the solutions package to address climate change. Recent studies such as the Institute for Global Environmental Strategies' *1.5-Degree Lifestyles* report illustrate the scale of the sustainable living challenge: the need for reductions of over 80 per cent in GHGs by 2050 from today's intensity of lifestyles. This study proposes that we need to aim for lifestyle carbon footprint targets of 2.5 (tCO_2e) by 2030, 1.4 by 2040, and 0.7 by 2050. Even developing countries need to reduce footprints by 23–84 per cent, depending on the country and the scenario, by 2050.

Similarly, shifting to renewable forms of energy production can enable us to achieve only a bit more than half of the required reductions in global GHG emissions. In order to tackle the remaining half, consumption patterns and dominant lifestyles need to be shifted with the support of circular economy interventions. Consumer choices for eco-designed products need to be available and accessible, waste within product chains and end-of-product-life need to be eliminated, keeping materials in use needs to be made easy for consumers, and regenerative forms of living need to be supported.

Cities, where consumption and production meet, provide the perfect leverage points for enabling 1.5°C living. A few leading cities are taking action by integrating circularity into their own procurement of goods and municipal services, enabling circular business models to flourish, making resource-efficient products more accessible, creating awareness among city dwellers, and empowering citizen-led initiatives. These concentrate on three priority domains – nutrition, housing and mobility – which cover the majority (approximately 75 per cent) of city dwellers' carbon footprints.

Social Equity

A growing political consensus is globally forming that climate action needs to systematically incorporate social equity considerations. Cities have been integrating equity frameworks into their climate planning and developing innovative tools and approaches to ensure implementation. In all cases, collaboration with residents and local stakeholders is a key component to ensure that different needs are considered, and no one is left behind on the path to more climate-friendly urban environments.

When analysing equity-focused programmes, three different dimensions or pathways to address inequalities emerge. These are by no means mutually exclusive – very often, programmes succeed best when all three aspects of social equity framework are considered early on:

1. Access – Depending on factors like age, neighbourhood, income, gender, social groups and language, among others, not all residents have the same access to public services and infrastructures. Local governments can strengthen inclusive access by considering affordability, different target groups and contact points for support. Very often, a mapping of accessibility per neighbourhood is a useful step to identify gaps and needs for improvement.
2. Participation – This dimension refers to the governance aspect of equitable design, emphasizing both the involvement of residents in the process and the engagement of underrepresented voices. The more programmes are designed with rather than for residents, involving those affected early on, the more they meet local needs and generate long-term impacts. This can be ensured through active outreach and citizen-led engagements like co-creation, which also increase public acceptance and ownership.
3. Opportunity – Unfortunately, current education and employment systems still perpetuate social inequalities, pre-determining questions of access and freedom of choice. To offer fair prospects for all, local governments are targeting: (i) equal access to quality education early on; (ii) increased career prospects through training and support programmes; and (iii) increased diversity in employment in public institutions.

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3. Opportunity – Unfortunately, current education and employment systems still perpetuate social inequalities, pre-defining questions of access and freedom of choice. To offer fair perspectives for all, local governments are targeting 1) equal access to quality education early-on, 2) provision of career perspectives through training and support programs and 3) increased diversity in employment in public institutions and through procurement tools and stakeholder cooperation. In strengthening the local labour market, key questions relate to connecting available talent and skills to employer's needs as well as to the quality and sustainability of jobs created.

SOCIAL EQUITY FRAMEWORK

URBAN TRANSITIONS ALLIANCE
Industrial legacy. Sustainable future.

While citizen-led climate action scales impact and drives political momentum, decision-makers have understood that ambitious programs need to address social consequences to ensure no one is left behind.

Breaking down the concept of social equity into three simple dimensions helps to:

- **communicate** about social equity with different stakeholders,
- **mainstream** equity thinking and
- ensure sustainability programs are **designed to increase** equity and foster a just transition.

ACCESS

More equal access to public services and infrastructures – independent of factors like age, neighborhood, income, social group or language.

PARTICIPATION

Programs designed with rather than for residents, including all voices across the city and involving those affected early-on, to meet local needs and generate long-term impacts.

OPPORTUNITY

Fair perspectives for all through 1) improved access to quality education, 2) provision of career perspectives and 3) increased diversity in employment.

Source: Urban Transitions Alliance

WAC.1 ZERO WASTE CITIES

Impact 3

WASTE AND CONSUMPTION – ZERO-WASTE CITIES

MITIGATION

NEXUS

	By 2021	By 2025	By 2030	By 2040
Policymakers (national, subnational, local levels)	• Commitments to moving up on the waste management hierarchy • Increased awareness on circular economy action plans, material leaks and circularity scan	• Collect waste composition data and set collection & reduction targets for carbon intensive materials in waste • Set targets for food waste reduction (SDG12) • Eliminate single use plastic	• Set up circular business model supporting programs • Set mandatory criteria for circularity in public procurement for high-carbon impact products and services • Integrate circular thinking in	• Monitor collection & reduction targets for carbon intensive materials in waste • Implement circular public procurement plans driving eco-design in public

- Increased awareness how to leverage public procurement to implement circularity
- Increased awareness on circular thinking in waste management plans, municipal services and urban development
- Design circular business model supporting programs and run capacity building programs for businesses
- Raise awareness around existing circular economy initiatives in their jurisdictions, run campaigns to encourage new habits amongst citizens (EMF)
- Assess fiscal measures such as tax breaks to stimulate circular economy activity (e.g. repair, share, reuse), tax reductions on the use of secondary materials, charges and tariffs to incentivize behaviour change, or fines
- Leverage bans to prohibit the circulation of goods, materials that are problematic (EMF)
- Collect data on municipal solid waste composition and generation and identify intervention areas to increase packaging (AEPW)
- Elaborate targets on construction and textile waste reduction
- Put in place the appropriate infrastructure required for a circular economy such as asset-sharing infrastructure, waste collection systems, treatment facilities, material banks, disassembly and recycling centres (EMF)
- International Trade Policies & Standardisation (EMF)
- Targets and frameworks in place for circularity in public procurement - X% of public spending towards circular products, materials, business models
- Include voluntary circularity criteria in flagship public procurements
- Implement fiscal measures such as tax breaks to stimulate circular economy activity, charges and tariffs to incentivize behaviour change, or fines
- waste management plans
- 50 per cent reduction of primary resource consumption of procured goods
- infrastructure and services
- Aim for 100% of tenders include criteria on circularity

	the 5R (Rethink, Reduce, Refuse, Reuse and Recycle)	
Financial Institutions	• Develop credit lines and investment facilities for alternative building materials • Develop innovative financing tools for waste collection, reduction, recovery. • Co-financing/public-private financing to support circular economy related projects, circular economy incubator and investment programmes – especially those that are high potential but high risk	
Technology Providers and Innovators	• Support mechanical recycling technology transfer firstly in Asia and Africa	• Use public procurement of innovation to get support for the creation of novel products and services
Business and Service Providers	• Scale-up capacity building among business service providers on eco-design • Embed Extended Producer Responsibility (EPR) in waste management plans • Embed awareness of circular design into innovation teams • Integrate circular economy	

	into company strategy • Pilot, innovate and invest in circular materials, products, and business models • Run corporate communication campaigns and public awareness campaigns in order to establish trust in secondary products and materials, help users accept access-over-ownership business models etc. • Support IWM via Alliance to End Plastic Waste • Take part in market dialogue opportunities with the public sector
Civil society	• Build capacity and provide TA on circular thinking in waste management and policy instruments, including development of tools and frameworks (EMF) • Convene stakeholders (alongside local government) at the local level to stimulate collaboration around circular economy opportunities (EMF)

EXISTING INITIATIVES

NAZCA initiative (with hyperlink)	
C40 Zero Waste Declaration	
Cities Climate Finance Leadership Alliance (CCFLA)	The Cities Climate Finance Leadership Alliance (CCFLA) is a coalition of more than forty organizations actively working to accelerate investment into sustainable infrastructure. [1] The Alliance brings together a wide range of public and private institutions.
Global Lead City Network on Sustainable Procurement	GLCN is a group of 16 cities committed to drive a transition to sustainable consumption and production by implementing sustainable and innovation procurement. The GLCN enables leading cities in the field of sustainable public procurement (SPP) to showcase ambitious, quantified targets and achievements in four priority sectors; meet, share and develop capabilities to implement sustainable purchasing practices; help develop a supportive political framework for implementation; act as global and regional champions of SPP, foster the role of public procurement for global sustainable development. More: https://glcn-on-sp.org/home/
Leadership for Urban Climate Investment (LUCI)	The Leadership for Urban Climate Investment (LUCI) is an initiative under the ICLA track offering a comprehensive and transformative approach in sealing gaps in the investment value chain by establishing a global financing framework through synergies between countries, international and national financial institutions, international organisations, climate institutions and funds, and other partners. The initiative also seeks to achieve subnational financing through supporting bankable projects, capacity building of national and subnational development banks, and improving financing options.
Planners for Climate Action	Planners for Climate Action is a cooperative initiative born at the 23rd Conference of Parties (COP-23) to the UN Framework Convention on Climate Change (UNFCCC), in Bonn on 11 November 2017. The

	initiative, convened by UN-Habitat, is comprised of associations of planning practitioners and planning educators, collectively representing tens of thousands of planners worldwide, as well as other partners active in this area.
Urban-LEDS project	The Urban-LEDS project addresses integrated low emission and resilient development in more than 60 cities in 8 countries: Brazil, India, Indonesia and South Africa (from Phase I) and countries added in Phase II: Bangladesh, Colombia, Lao PDR and Rwanda. In addition to these countries, 16 European cities will act as source cities and support peer-to-peer exchange and cooperation.
One Planet Network Sustainable Public Procurement Programme	The One Planet Network Sustainable Public Procurement (SPP) programme is a voluntary global multi-stakeholder partnership in which various parties - governmental, non-governmental, public and private, agree to work together in a systematic way with the aim to promote and accelerate the implementation of sustainable public procurement globally as a way to ensure sustainable consumption and production patterns. https://www.oneplanetnetwork.org/sustainable-public-procurement
Other Initiative (with hyperlink)	
Urban Transition Alliance	The Urban Transitions Alliance is designed for ambitious cities with industrial legacies to share knowledge, discover new solutions and better navigate their urban transitions towards a sustainable and equitable future. A global network of industrial legacy cities who have all committed to realizing sustainable and inclusive urban transitions, paving the way for other industrial cities to follow. A living knowledge hub of innovative policies and projects, investigating how sustainability programs can be designed to benefit all residents and increase equity. A service and support tool for cities to access the expertise, research and collaborative space they need for existing and future transition plans.
Green Circular Cities Coalition	Green Circular Cities Coalition in 2019, presenting a platform to connect cities, experts, businesses and relevant stakeholders to shift the mindset from “waste management” towards “resource management”, reduce waste, and increase circularity via experiences exchange and mutual learning.

WIEGO - Waste Pickers	Waste pickers collect household or commercial/industrial waste. They may collect from private waste bins or dumpsters, along streets and waterways or on dumps and landfills. Some rummage in search of necessities; others collect and sell recyclables to middlemen or businesses. Some work in recycling warehouses or recycling plants owned by their cooperatives or associations.
PREVENT Waste Alliance	The PREVENT Waste Alliance is financed by the German Federal Ministry for Economic Cooperation and Development (BMZ) and its main objectives are to contribute to waste minimisation and to maximize the reutilization of the world resources, particularly in low and middle-income countries
Waste Wise Cities by UN-Habitat	Waste Wise Cities was launched by UN-Habitat in 2018 with a call to action to improve solid waste management in the world's cities. Cities and local governments that join Waste Wise Cities commit to its 12 principles of sustainable waste management, including the 5Rs (Rethink, Reduce, Refuse, Reuse and Recycle). More information at https://unhabitat.org/waste-wise-cities
Zero Waste International Alliance	The Zero Waste International Alliance (ZWIA) is a group of environmental professionals dedicated to working towards a world without waste through public education and practical application of Zero Waste principles. By disseminating knowledge and providing support to its members ZWIA is promoting the implementation of Zero Waste Principles in various aspects.
Ellen MacArthur Foundation	The Ellen MacArthur Foundation was launched in 2010 to accelerate the transition to a circular economy. Since its creation, we have emerged as a global thought leader, establishing the circular economy on the agenda of decision makers across business, government, and academia.
Alliance to End Plastic Waste	The Alliance to End Plastic Waste is an international non-profit organization partnering with government, environmental and economic development NGOs and communities around the world to address the challenge to end plastic waste in the environment.

FURTHER REFERENCES

ISWA	
International Resource Panel	
Ellen MacArthur Foundation	**Ellen MacArthur Foundation Publications Page. Of particular relevance:** **Completing the Picture: How the Circular Economy Tackles Climate Change** **City Governments and their role in enabling a circular economy transition**

WAC.2 1.5 ºC LIVING

Impact 4

WASTE AND CONSUMPTION - 1.5ºC LIVING

MITIGATION/ ADAPTATION & RESILIENCE

NEXUS

	By 2021	By 2025	By 2030	By 2040
Policymakers (national, subnational, local levels)	• Increased awareness on that urban consumption is a key driver of global GHG emissions and the role of local governments to tackle them. • Improved insights into benefits for a city and its residents in cutting consumption-based	• Prepare consumption-based inventories integrating them into the NDCs • Make pledges in priority areas of consumption (sustainable diets, mobility, housing) • Connect climate targets to procurement strategy and timeline	• Develop policy mix to decrease emission from consumption in high-income cities by two third.	

	emissions. • 1.5D Living campaigns (Finland, Japan already in 2020). • Start monitoring the impact of sustainable procurement on emission reduction	• Raise awareness about the power of green public procurement and start practicing it in high-impact procurements
Financial Institutions		
Technology Providers and Innovators		
Business and Service Providers		
Civil society	• Advocating for consumption-based footprint inventories, developing capacities.	

EXISTING INITIATIVES

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Leadership for Urban Climate Investment (LUCI)	The Leadership for Urban Climate Investment (LUCI) is an initiative under the ICLA track offering a comprehensive and transformative approach in sealing gaps in the investment value chain by establishing a global financing framework through synergies between countries, international and national financial institutions, international organisations, climate institutions and funds, and other partners. The initiative also seeks to achieve subnational financing through supporting bankable projects, capacity building of national and subnational development banks, and improving financing options.

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Urban-LEDS project	The Urban-LEDS project addresses integrated low emission and resilient development in more than 60 cities in 8 countries: Brazil, India, Indonesia and South Africa (from Phase I) and countries added in Phase II: Bangladesh, Colombia, Lao PDR and Rwanda. In addition to these countries, 16 European cities will act as source cities and support peer-to-peer exchange and cooperation.
One Planet Network Sustainable Public Procurement Programme	The One Planet Network Sustainable Public Procurement (SPP) programme is a voluntary global multi-stakeholder partnership in which various parties - governmental, non-governmental, public and private, agree to work together in a systematic way with the aim to promote and accelerate the implementation of sustainable public procurement globally as a way to ensure sustainable consumption and production patterns. https://www.oneplanetnetwork.org/sustainable-public-procurement
Other Initiative (with hyperlink)	
Urban Transition Alliance **(ICLEI)**	The Urban Transitions Alliance is designed for ambitious cities with industrial legacies to share knowledge, discover new solutions and better navigate their urban transitions towards a sustainable and equitable future. A global network of industrial legacy cities who have all committed to realizing sustainable and inclusive urban transitions, paving the way for other industrial cities to follow. A living knowledge hub of innovative policies and projects, investigating how sustainability programs can be designed to benefit all residents and increase equity. A service and support tool for cities to access the expertise, research and collaborative space they need for existing and future transition plans.

Green Circular Cities Coalition (ICLEI)	Green Circular Cities Coalition in 2019, presenting a platform to connect cities, experts, businesses and relevant stakeholders to shift the mindset from "waste management" towards "resource management", reduce waste, and increase circularity via experiences exchange and mutual learning.
ICLEI – Climate Neutrality Framework	Through the low emission pathway, local and regional governments step up to achieve climate neutrality and deliver on global climate goals. Our vision of climate neutrality is a holistic process that includes ambitious climate change mitigation and adaptation at home and additional contributions to global climate processes and mechanisms.
C40 – Deadline 2020	Deadline 2020 is the first significant routemap for achieving the Paris Agreement, outlining the pace, scale and prioritization of action needed by C40 member cities over the next 5 years and beyond.
Urban Pathways	Urban Pathways is supporting Low Carbon Plans for Urban Basic Services in the context of the New Urban Agenda, implemented by UN-Habitat in cooperation with UN Environment and the Wuppertal Institut. The project follows a structured approach to boost Low Carbon Plans for urban mobility, energy and waste management services in pilot and replications cities, working on concrete steps towards a maximum impact in cities to global climate change mitigation efforts and sustainable and inclusive urban development. More information at https://www.urban-pathways.org/
1.5 Degree Life Campaign	By 1.5-degree life we mean a lifestyle that is sustainable and climate friendly - a lifestyle that does not accelerate climate change or overconsume nature. 1.5 degrees refers to the objectives of the Paris Agreement, In collaboration with Turku Youth Council, the City of Turku challenges you to share your best everyday climate tips by means of video art. Turku has challenged the Yokohama city, Nagano city and Obuse town to take part of the competition simultaneously in Japan. Yokohama will join Turku's campaign by selecting 3 best videos and sending them to Turku for separated category of international voting where Yokohama's winner will be chosen. : https://www.turku.fi/en/news/2020-10-29_take-part-15-degree-life-video-competition

FURTHER REFERENCES

IGES – 1.5°C Lifestyle	IPCC Special Report on 1.5oC Summary for Urban Policy Makers

WAC.3 SOCIAL EQUITY

Impact 5

WASTE AND CONSUMPTION – SOCIAL EQUITY

ADAPTATION & RESILIENCE

NEXUS

	By 2021	By 2025	By 2030	By 2040
Policymakers (national, subnational, local levels)	• Equity thinking is mainstreamed in policy design to ensure social consequences are recognized and taken into account • Individuals and groups affected have a voice and are included in policy design early-on	• Climate policies and interventions are designed to 1) enable access for all, 2) foster participation and co-creation and 3) offer equal opportunities for all • Leverage the procurement process to support gender equality, fair working conditions		

	• Public administrations and decision-makers receive equity trainings to ensure common understanding and language • Market policies enable economic diversification and localization to diversify employment opportunities • Integrate social responsibility into public procurement strategy • Sustainability and social justice must go together, both locally and globally	and social enterprises • Actions to address the climate crisis must not further disadvantage people and communities who already experience significant inequalities; and secondly, that actions to create a safer and more sustainable city must also be aimed at building a just and more equal city
Financial Institutions	• Societal costs of inequalities are recognized • Finance tools and funding methods are developed and mainstreamed to strengthen equity outcomes, e.g. participatory budgeting, socially responsible public procurement, Social Impact Bonds, tax incentives for equity-conscious investments • Transparency and accountability in public financial management are strengthened	• Green Investment can deliver multiple benefits – for instance, housing retrofit co-benefits local jobs to reduce carbon emissions and deliver affordable warmth for residents, which is a winning combination.
Technology		• Intervention and rapid mobilisation of science,

Providers and Innovators		technology and finance which has been set against the virus being harnessed for the climate emergency.	
Business and Service Providers	• Social entrepreneurship and social innovation are fostered through targeted policies as well as education and support programs • Training and job opportunity programs offer entry support for new employments fields to contribute to a just transition • Employers are encouraged / bound to ensure diversity of staff and quality jobs		
Civil society	• CSOs and are invited and empowered to contribute to policymaking • Civil society is strengthened through support and training opportunities • Time and capacity investments of civil engagements are recognized and accounted for	• To advocate for and strengthen social equity is not considered as "turf" of civil society / social organizations, but as joint task of all parts of society and public institutions	

Source: Urban Arenas for Sustainable and Just Cities

EXISTING INITIATIVES

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Other Initiative (with hyperlink)	
Urban Transition Alliance	Launched in 2017, the Urban Transitions Alliance is a city network and knowledge-exchange hub of innovative urban transition policies and projects. With an overarching social equity focus, it supports industrial legacy cities from across the globe to identify common challenges, share knowledge and develop equitable solutions to successfully guide their individual sustainable transitions.
Green Circular Cities Coalition	Green Circular Cities Coalition in 2019, presenting a platform to connect cities, experts, businesses and relevant stakeholders to shift the mindset from “waste management” towards “resource management”, reduce waste, and increase circularity via experiences exchange and mutual learning.
Urban Arenas for Sustainable and Just Cities	The UrbanA project is distilling innovative urban solutions for sustainable & just cities. This is a co-creative process with city-makers and city-thinkers.

FURTHER REFERENCES

GCoM – Global Task Force Joint Declaration	**Right to the City**

CONTRIBUTIONS

Under the leadership of the High-Level Champions and through the Marrakech Partnership for Global Climate Action, the development of this Climate Action Pathway was led by the Global Alliance for Buildings and Construction and ICLEI in collaboration with C40 Cities, World Business Council for Sustainable Development (WBCSD), World Green Buildings Council (WGBC), FMDV, Carbon Disclosure Project (CDP), Regions4, Climate Policy Initiative, Global Covenant of Mayors for Climate & Energy (GCoM), Regions20, The Climate Group, UN Habitat, WWF, United Nations Environment Programme (UNEP), Cool Coalition, Ellen MacArthur Foundation (EMF), French Ministry of Environment, Climate Policy Initiative, Carbon Trust and Climate Chance.