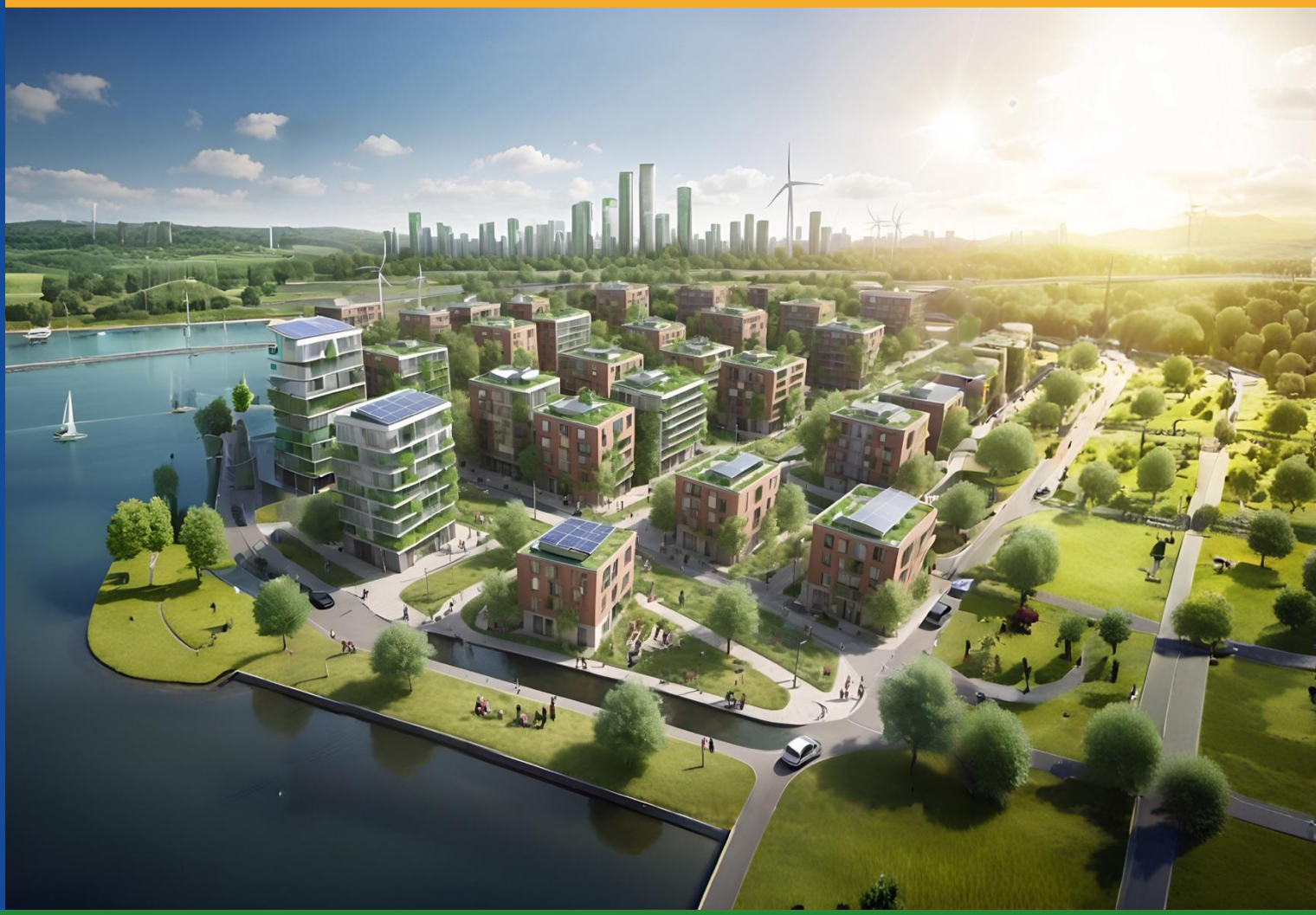

NDCs for Buildings

Ambitious, Investable, Actionable, and Inclusive

Guidance for Policymakers and Practitioners in the 2025 NDC Revision

November 2024

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List of Abbreviations

GDP	Gross Domestic Product
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH
GlobalABC	Global Alliance for Buildings and Construction
IFC	International Finance Corporation
IPCC	Intergovernmental Panel on Climate Change
M&E	Monitoring and Evaluation
MERL	Monitoring, Evaluation, Research, and Learning
MRV	Measurement, Reporting, and Verification
NDC	Nationally Determined Contribution
PEEB	Partnership for Energy Efficiency in Buildings
SDGs	Sustainable Development Goals
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WorldGBC	World Green Building Council

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The GlobalABC, hosted by UNEP, is the leading platform for all buildings stakeholders committed to a common vision: a zero-emission, efficient, and resilient buildings and construction sector. It aims to be a global advocate for the buildings transformation, provide key measures for governments, and support the private sector transition towards business models focused on decarbonisation.

PEEB Cool is a programme under the umbrella of the Partnership for Energy Efficiency in Buildings (PEEB) that provides technical assistance and financial support to 11 countries in hot climates across Africa, Asia, Eastern Europe, and Latin America.

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Published in November 2024

1 Summary: NDCs for Buildings
Ambitious, Investable, Actionable, Inclusive

This guide provides guidance for planners, policymakers, and practitioners in the revision and enhancement of countries' NDCs for the built environment, i.e. buildings and construction.

Nationally Determined Contributions (NDCs) are an excellent opportunity to accelerate climate action in the built environment. These national climate commitments, submitted under the Paris Agreement, outline each country's strategy to reduce greenhouse gas emissions and enhance resilience to climate impacts.

By early 2025, countries are expected to unveil their updated NDCs, creating a critical opportunity to strengthen efforts in the built environment sector, which is a sleeping giant in terms of its abatement potential. While 87% of countries already mention measures for the buildings and construction sector in their NDCs (Partnership for Energy Efficiency in Buildings (PEEB), 2023), most NDCs do not back up substantive and technical measures with the support needed to actualise and achieve them. There is considerable need for NDCs to put forward substantial, far-reaching, and comprehensive measures for the sector, driving impactful climate action. This would generate a range of co-benefits including job creation, better public health, lower energy bills, and enhanced energy security.

To maximise their impact, new NDCs should be: ***Ambitious, Investable, Actionable, and Inclusive.***

- **Ambitious**: NDCs should aim for high-impact goals that significantly accelerate climate action and drive substantial progress across a broader range of mitigation and adaptation priorities in the sector;
- **Investable**: NDCs must be designed with climate finance eligibility in mind, be well costed, and have clear financial strategies for securing necessary funding from public or private sources;
- **Actionable**: NDCs should be practical and achievable with available resources, and allow for clear implementation mechanisms and reliable measurement of progress;
- **Inclusive**: NDCs must represent the interests and priorities of as wide a spectrum of stakeholders as possible, and must address the needs of all sectors of society.

This can be done in five steps:

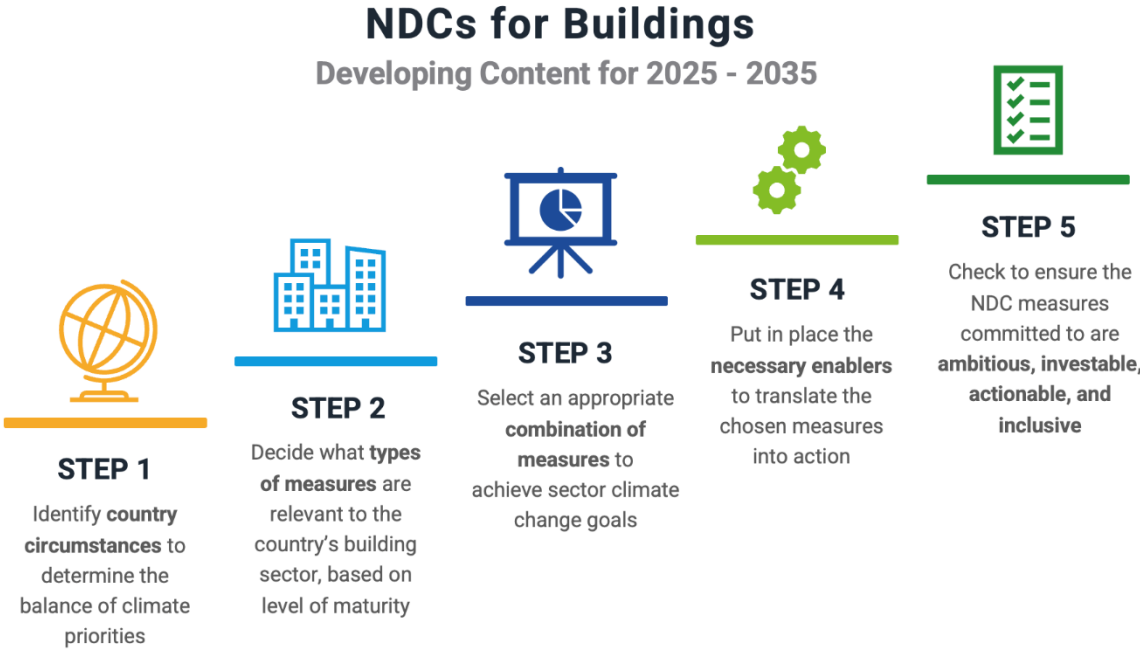


Figure 1: Developing NDC content on the built environment

How to Use This Guide

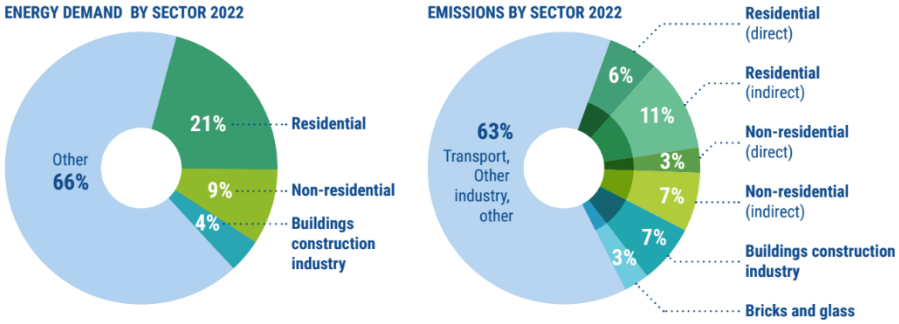
This guide supports practitioners and policy-makers when revising and enhancing NDCs for the 2025 submission.

- Facts and figures: Sections 2 and 3 explain the context and present useful information on built environment measures in NDC, and make the case for enhanced NDC content on the built environment.
- Five steps to develop NDCs: Section 4 sets out five steps to develop stronger NDC measures for buildings and construction. It provides support for the "what" (i.e., what types of measures, and examples of substantive policy options to include in the commitments) and the "how" (i.e., how to roll out the measures to improve the chances of achieving them).
- Models for NDCs: Section 5 provides concrete examples for crafting impactful NDC measures by giving **exemplary models** of three existing NDCs and a **blueprint for text**, with a structure for presenting the measures.

2 The Relevance of NDCs for Buildings

Why Buildings and Construction?

The built environment is a "sleeping giant" for climate action with vast untapped potential for impactful action (Partnership for Energy Efficiency in Buildings (PEEB), 2023). Currently, the buildings and construction sector accounts for 21% of global annual greenhouse gas (GHG) emissions (Intergovernmental Panel on Climate Change, 2022) (United Nations Environment Programme (UNEP), 2024).



(Source: IEA 2023a. Adapted from 'Tracking Clean Energy Progress')

Notes: Buildings construction industry refers to materials used in construction, including concrete, steel and aluminium. Other materials shown separately.

Figure 2: Energy demand and emissions by sector

In 2022 alone, the sector accounted for 37% of global energy and process-related carbon dioxide (CO_2), and an estimated 34% of global final energy demand (United Nations Environment Programme (UNEP), 2024). These figures are projected to grow as incomes rise globally and populations rapidly urbanise.

New construction presents a significant opportunity for climate change mitigation: about half of buildings expected by 2050 have yet to be built (United Nations Environment Programme, 2024). Between now and 2030, around 80% of the growth in floor area will occur in low-income countries, many of which don't have robust building codes (United Nations Environment Programme (UNEP), 2024). Existing buildings also offer substantial mitigation potential. Achieving net-zero emissions by 2050 requires retrofitting at least 20% of current building stock to zero-carbon levels, necessitating an increase in renovation rates to 2% annually by 2030, up from 1% in 2022 (International Energy Agency (IEA), 2022). The built environment impacts everyone, everywhere. It safeguards people from soaring temperatures, intensifying storms, and rising floodwaters. Therefore, resilient buildings and infrastructure are foundational to climate adaptation measures. Vulnerable buildings exacerbate the climate risks for occupants, impacting health, well-being, and productivity. To enhance resilience, buildings must be made more robust against rising temperatures, rainfall variability, storms, and other extreme weather events.

Climate change conferences have driven momentum for climate action in the built environment, notably through "built environment days" at COP 26 and COP 28. The Buildings Breakthrough Initiative launched at COP 28 was a milestone, with countries committing to work together to make near-zero emission and resilient buildings the norm by 2030 (GlobalABC, 2023). Additional momentum has come from the Buildings and Climate Global Forum, and the resulting Declaration de Chaillot.

What Can NDCs Do to Drive Climate-Responsive Investment in the Built Environment?

NDCs are a key policy framework to drive climate change action and investments. NDCs serve as a cornerstone for guiding global efforts towards the Paris Agreement's 1.5 degree Celsius goal, reducing greenhouse gas emissions and enhancing resilience to climate impacts. NDCs submitted in 2025 will guide climate action through 2035. NDCs can drive policy coherence and coordination across sectors, ensuring that climate actions in the built environment are aligned with broader national development goals and integrated into urban planning, building codes, and infrastructure development.

By improving and enhancing NDCs in 2025 – with the integration of clear targets, key performance indicators (KPIs), and implementation roadmaps – countries attract significant private and public investment, bridging existing financing gaps, scaling up climate action, and ensuring that targets can be met efficiently.

NDCs are an opportunity to outline finance gaps and needs per sector and set the groundwork for international and domestic investment in a sector. If NDCs were properly financed, they could drive unprecedented changes in key sectors, such as the built environment, fostering sustainable growth and innovation. Investable NDCs should, therefore, include detailed strategies for attracting public and private investments, leveraging international climate finance, and fostering innovative financing mechanisms.

Key Resources

Countries updating their NDC's content on buildings have access to a number of useful resources. A fuller list is provided in Section 5 of this guide. Some of the most important ones are noted below, with links:

UN Environment Programme, Global Status Report for Buildings and Construction 2023. https://wedocs.unep.org/bitstream/handle/20.500.11822/45095/global_status_report_buildings_construction_2023.pdf?sequence=3&isAllowed=y

Programme for Energy Efficiency in Buildings, Mapping Targets on Buildings in the Nationally Determined Contributions (NDCs) 2023. https://www.peeb.build/imglib/downloads/PEEB_Report_Buildings-in-the-NDCs.pdf

GlobalABC, Roadmap for Buildings and Construction 2020-2050: Towards a Zero-Emission, Efficient, and Resilient Buildings and Construction Sector 2020 https://globalabc.org/sites/default/files/inline-files/Global%20Roadmap_FINAL.pdf.

UNEP, UNDP, UNFCCC, Building Circularity into Nationally Determined Contributions: A Practical Toolbox – User Guide 2023 https://www.learningfornature.org/wp-content/uploads/2023/10/Building-Circularity-into-NDCs_A-Practical-Toolbox-User-Guide-Final.pdf

UN Environment Programme, Building Materials and the Climate: Constructing a New Future 2023 https://wedocs.unep.org/handle/20.500.11822/43293

UNFCCC, Compendium on Greenhouse Gas Baselines and Monitoring: Building and Construction Sector 2021 https://unfccc.int/sites/default/files/resource/UNFCCC%20Compendium%20GhG%20Building%20Sector.pdf

3 State of Integration of Buildings in NDCs

What is in the NDCs on Buildings Today?

Countries have signalled a growing recognition of the role that the built environment plays in climate action.
The number of NDCs that mention buildings has increased considerably since countries first began submitting their NDCs in 2015-2016 (as captured in Figure 3) (United Nations Environment Programme (UNEP), 2024).

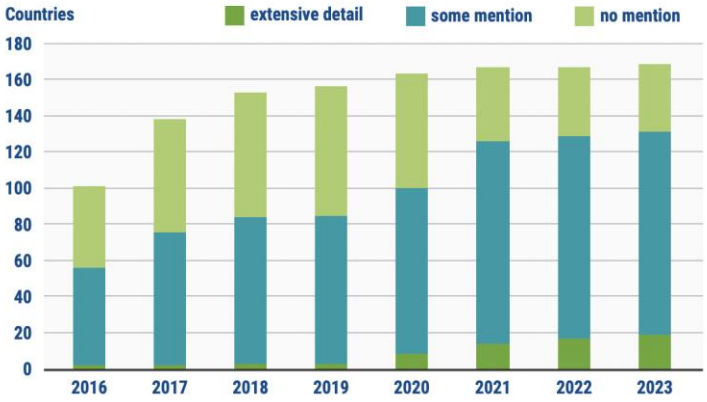


Figure 3: Number of unique NDCs mentioning buildings, by the level of detail (Source: GABC; (United Nations Environment Programme, 2024))

A recent analysis of 194 countries' NDCs found that 84% (167 countries) include measures related to the built environment (Partnership for Energy Efficiency in Buildings (PEEB), 2023). Mitigation is the clear frontrunner in buildings-related measures. 80% of all NDCs analysed embrace mitigation action in the buildings sector.

Energy efficiency in design – including policy interventions such as building codes and certifications, as well as design innovations such as passive cooling and reflective surface finishes – is referenced in 113 out of 167 NDCs (68%). Beyond such approaches, NDCs contain measures that tackle energy efficiency in appliances (62%), renewable energy (43%), building materials (38%), cooking (32%), and retrofitting existing buildings (20%).

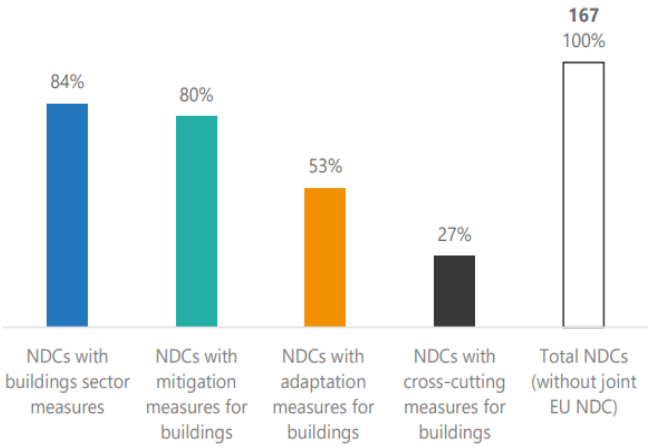


Figure 4: NDCs by type of measure for buildings (PEEB, 2023)

About half, i.e., 53% of NDCs analysed address buildings sector adaptation, including strengthening structures (40%), improving site planning (32%), and raising climate risk awareness (11%).

Regionally, Africa leads with 94% of NDCs mentioning buildings and construction, followed by Asia (89%), the Americas (83%), Oceania (75%), and Europe (56%). Notably, middle- and low-income countries (87% and 93%) have a higher inclusion rate of building sector measures compared to high-income countries (73%) (Partnership for Energy Efficiency in Buildings (PEEB), 2023).

3.1 Gaps and Opportunities - What is Needed in the Next Generation of NDCs?

Despite progress, gaps remain. Only 18% of all NDCs have quantifiable mitigation targets for the built environment, and just 16% identify financing for these measures (Partnership for Energy Efficiency in Buildings (PEEB), 2023). Interviews with experts in the buildings and construction sector highlighted that the current generation of built environment measures is not yet comprehensive. Most NDCs contain built environment measures that only target one aspect of the sector such as energy efficiency of appliances. They do not pursue an integrated approach of the entire building, nor do they integrate a 'cradle-to-grave' or whole-life-carbon approach (such as including upstream measures like urban planning and design, or mid-stream measures related to materials and embodied energy, or downstream measures linked to circularity).

Adaptation commitments are present in only half of NDCs that mention the built environment, and resilience-focused measures are underrepresented. The NDCs that do include resilience typically mention improved urban planning and selection of building sites or zones. Two-thirds of the NDCs that mention resilience in the sector include commitments to adapting existing and future building structures to climatic changes.

There is also a need for more comparable NDCs, with more consistency in the level of detail and the inclusion of quantitative targets. This would make it easier to gauge levels of ambition.

NDCs should also use more inclusive and accessible terminology reflecting the experience of everyone in the built environment, including those who do not live in formally constructed housing. For instance, some experts interviewed for this guide observed that the phrase 'buildings and construction' excludes communities living in informal settlements. They emphasised that the focus of language on sustainability in the sector should be accompanied in equal measure with an emphasis on security and liveability, which are still out of reach for millions but are not mentioned as often in NDCs.

3.2 Barriers to Overcome for Effective NDCs for the Built Environment

Achieving NDC measures in the built environment faces several challenges. These include the following:

1. **Lack of experience with climate mitigation and adaptation in the buildings sector:** While the buildings sector has had a long track record of mitigation measures through the reduction of operational energy (e.g., energy efficiency), there is less experience with other elements of mitigation such as reducing embodied carbon (with low-carbon materials), and circularity. Experience with adaptation measures in the sector is even smaller.

2. **Fragmentation:** Decision-making is split across multiple government departments and levels of jurisdiction, complicating coordination. The sector also involves many stakeholders, making it difficult to influence all necessary actions.

3. **Emissions spread across IPCC categories**: This diffusion makes it difficult to track and manage the full lifecycle of emissions from the sector. Policymakers thus struggle to understand and address the sector's full emissions impact.

4. **Data inadequacy and suboptimal monitoring:** The built environment (or buildings and construction) is not treated as a distinct sector in national GHG emissions accounting and inventories, due to the classification of emission categories per the IPCC's methodology. Instead, emissions from the built environment get disaggregated across several sub-categories such as energy use, industrial processes and product use, manufacturing, air conditioning or cooling, or waste, etc. The sector's heterogeneity makes data collection and synthesis challenging. This impedes effective target-setting and tracking of both mitigation and adaptation measures.

5. **Low replicability for finance:** The regionalised and fragmented nature of the sector makes it difficult for investors to find scalable opportunities, complicating the aggregation of projects for large-scale financing.

Expert Recommendations on Priorities in the Next Generation of NDCs

Experts interviewed for this guide[1] highlighted a range of recommendations for the 2025-2035 NDCs:

Building Energy Codes

- The building performance standard does not need to be ambitious at the point of introduction. It is reasonable to establish a low-level entry point for performance, give the industry time to adapt, and then steadily ramp up the performance requirements.
- Thermal comfort must become central to codes, standards, and planning guidelines (e.g., reflective paint, thermal mass or insulation, natural ventilation). This is key in many low- and middle-income countries where warming may have greater impacts, new construction is anticipated, and informal settlements are growing.
- Standards should reflect local market conditions, e.g., with locally relevant baselines and based on locally available materials and products and specifications, but should target globally consistent levels of improvement (e.g., percentage-based) to be strengthened periodically.

Energy efficiency of appliances

- Energy efficiency of appliances is a low-hanging fruit as an NDC measure. This is an easy place to ratchet up ambition significantly (accompanied by ramping up enforcement).

Building Performance Labelling and Certification

- Countries should evolve from prescriptive, design-based building codes and standards to performance-based methods such as energy performance certificates. Ideally, performance standards should be in CO_2e per square meter over the entire life-cycle of the building, not just kilowatt-hour (kWh) per square meter of operational energy use.

Building Retrofits

- Countries should shift from voluntary to mandatory building codes and standards. Where codes exist only for new buildings, they should also be developed for existing buildings, i.e., codes on retrofits and renovations.

Electrification and Renewable Energy

- NDCs should promote electrification, especially through distributed renewable energy grid-interactive and grid-integrated buildings.
- Renewable energy integration is a crucial measure, especially if one can leverage locally available resources, such as solar energy, in a cost-effective way.

Construction Methods and Processes

- Supply chain sustainability, including efficiency in the production of materials, the use of low-carbon materials (particularly low-carbon cement and steel), and more efficient use of materials are crucial in NDCs.

[1] Interviews were conducted with the experts acknowledged on page ii.

Materials and Circularity

- NDC measures should incorporate circularity and regenerative technologies throughout the lifecycle, both upstream and downstream, with the preference for upstream reuse of building components to minimise the loss of value. These support both mitigation and adaptation.

Urban Planning for Adaptation and Resilience

- Adaptation measures in the built environment should get adequate emphasis.
- NDCs should reflect more systems thinking, and include measures on integrated urban planning.
- Urban planning must be geared toward "Building for the Future" by both improving the built environment's preparedness for climate-induced extreme weather – designing for future conditions rather than historical ones – and enhancing response and recovery capabilities to ensure systems can be restored quickly (e.g., through improved drainage and stormwater systems).
- In emerging economies, water management and water use in the built environment is crucial for adaptation and needs to be given attention in codes, standards, and incentives.
- The built environment should have more efficient and high-performing water and sanitation. This will enhance adaptation as water scarcity increases in many parts of the world.

Finance

- NDCs should promote more local financing solutions like microfinance for the built environment.
- Buildings are, by their nature, bankable. Most buildings are financed. But there needs to be stronger linkage between finance and climate. Multilateral Development Banks (MDBs) can take the lead and de-risk, and commercial banks must follow.
- Guarantees are extremely useful instruments and are proving very successful to make climate-responsive projects in the built environment more bankable and lower their risk for investors.
- More countries should explore instruments and mechanisms such as Green Bonds, which offer lower-cost financing. Green bonds are often more affordable than regular bonds; this is poorly understood.
- Public-private partnerships are very powerful to drive change in the market.
- Housing Finance Companies are a key channel for self-built housing (rather than developer-built). This type of highly heterogeneous housing can be influenced through housing finance institutions.

4 How to Build Effective NDCs for Buildings

When crafting NDC measures for the built environment, these five simple steps can help to make them ambitious, investable, actionable, and inclusive:

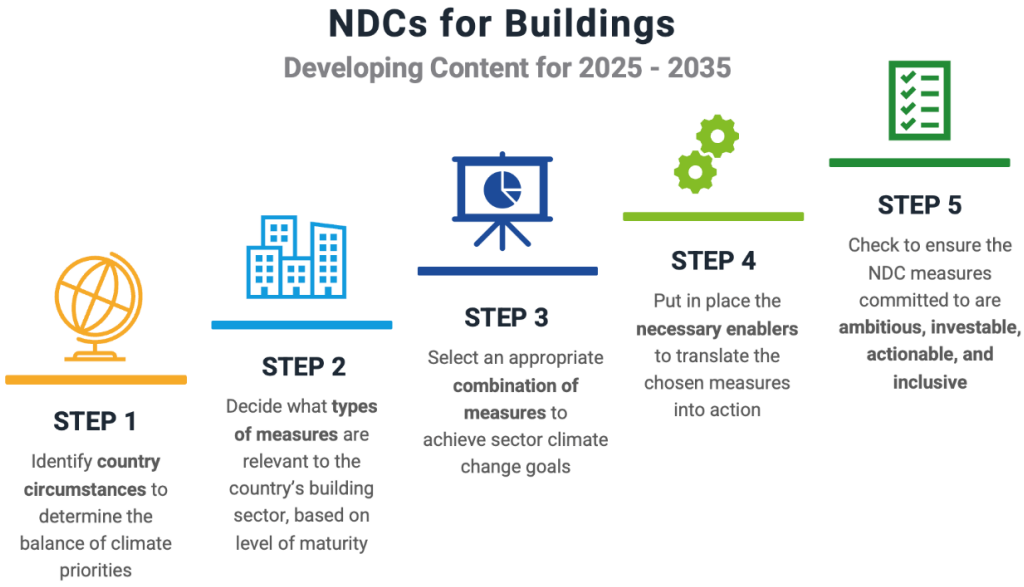


Figure 5: Five simple steps to develop built environment content in the NDC

Step 1: Identify Country Circumstances

Assessing priorities for the nation's own built environment sector should be the first step, based both on the sector's climate change needs as well as overall country context and national circumstances.

To identify the level of GHG emissions from the sector, this assessment should cover as wide a scope of sources as possible. A country should also have a clear picture, through a comprehensive emissions inventory, of whether and to what extent the emissions are rising, the rate of projected rise, the overall share of the buildings sector in national emissions in between the present and 2035 as well as through 2050, and – most crucially – which sources in the buildings sector account for dominant shares of the sector's emissions (e.g., construction, cement or steel, building energy use, etc.). This will help point to mitigation priorities and targets.

Similarly, it is also crucial, through comprehensive climate risk and vulnerability assessments, to identify which aspects of the buildings sector are most vulnerable and at risk, and should be prioritised for adaptation responses.

Such assessments also help point to an appropriate balance between decarbonisation and resilience measures for the sector in the NDC in Step 2. This is not a binary decision. All countries must adopt ambitious and meaningful mitigation *and* adaptation actions. In light of finite resources and the most pressing concerns, countries should calibrate the weightage of each, based on what the country's building sector emissions and risk profiles suggest.

Countries should also undertake technology and capacity assessments to gauge what their technical capacity and delivery systems allow for, and plan interventions accordingly. A country's income level is a useful preliminary reference point for the level of advancement of the built environment in the country, as high-income

nations tend to have more sophisticated codes, standards, and initiatives in the buildings and construction sector. Nevertheless, income level is not necessarily the only barometer of the sector's market maturity. There are several factors that can help determine the level of market maturity, i.e., the stage of evolution and growth of the sector.

Context relevance and appropriateness for national circumstances can go hand in hand with ambition, with the ambition suitably calibrated to the country's current starting point on mitigation and adaptation measures in the buildings sector.

To help decision-makers tasked with preparing NDC content on the built environment identify which measures might be relevant, and thus what the balance of climate priorities could be, this guide suggests a simple three-level categorisation of market maturity.

This provides a rough indication of which measures might be relevant. Nevertheless, countries should assess which measures are most suitable for their context. The categories are:

- **Stage I (Building Foundations):** Countries that are just beginning their decarbonisation journey of the buildings sector, and have limited to no experience with addressing adaptation in the sector. The focus is on establishing foundational measures such as basic energy efficiency improvements, initial renewable energy adoption, disaster risk planning and disaster risk response, and fundamental policy frameworks for mitigation and adaptation.

- **Stage II (Expanding and Enhancing):** Countries at this stage have made substantial progress in the buildings sector. They should now focus on advancing their efforts by integrating more complex strategies such as circular economy principles, equity-focused policies, and adaptation measures specific to the built environment. This stage involves refining and expanding decarbonisation practices to include embodied carbon, enhancing social equity in energy access, and preparing for climate impacts through improved planning, zoning, and efficient resource use.

- **Stage III (Achieving Net Zero and High Resilience):** This stage is for countries that are ready to take their decarbonisation efforts to the next level, aiming for a net-zero future. On the adaptation side, countries at this stage would be able to integrate resilience into building design features and performance, such as thermal comfort. The focus shifts to a highly integrated approach to mitigation and adaptation, and ensuring a just energy transition. Efforts include implementing cutting-edge technologies, and addressing broader systemic challenges to create a resilient and equitable energy landscape.

Step 2: Identify Relevant Types of Measures

STEP 2

Decide what **types of measures** are relevant to the country's building sector, based on level of maturity

The next step is to identify the most important *types* (or categories) of measures to consider for inclusion in the NDC. This is informed by the fields or sub-sectors that are most directly relevant to the country's climate priorities, as assessed in Step 1, above.
For instance, in some countries the energy consumption of existing old building stock might be the top mitigation priority, while in others, the focus might be on reducing emissions from building materials.

This guide identifies eight (8) broad types of fields (or categories of measures) to choose policy options from:

1. Building Energy Codes
2. Efficient Appliances, Building Systems, and Thermal Comfort
3. Building Performance Labelling and Certification
4. Building Retrofits
5. Electrification, Renewable Energy and Grid Integration
6. Construction Methods and Processes
7. Materials and Circularity
8. Urban Planning for Adaptation and Resilience

Not every type (category) of measure is relevant for every country, given varying national circumstances and levels of the sector's market maturity. The country's economic development trajectory, hydroclimatic profile, levels of access to formal versus informal housing, and the projected increase in new building stock compared to existing building stock in coming decades are all important factors to consider.

Thus, after high-level priority-setting is determined in Step 1, Step 2 is for countries to decide what the most relevant types of fields or categories of measures are within the built environment that should be the focus of the NDC. For example, if mitigation is a priority in Step 1, then – informed by the evidence referenced in Step 1 – countries decide in Step 2 *where* in the built environment mitigation actions would be most relevant.

Step 3: Select Appropriate Sectoral Measures

STEP 3

Select an appropriate **combination of measures** to achieve sector climate change goals

To identify relevant measures that could be included in NDCs, this guide provides a "menu of policy options" for each of the priority areas that were identified. This menu is based on a literature survey as well as expert interviews.

Policy-makers drafting NDCs can browse this menu of options to explore relevant measures. For each measure, and indication of market maturity is given, with the flexibility for countries to choose as outlined in Step 2.

To explore which specific measures or policy options to include, the NDCs of other countries also provide a relevant source of information. An overview of current NDCs by country and type of measure can be found here: Annex PEEB_Report_Buildings-in-the-NDCs.pdf. Some NDCs with extensive measures on the built environment can be found in *Section 5*.

Any measures selected for inclusion in an NDC should be accompanied by SMART targets that are **S**pecific, **M**easurable, **A**chievable, **R**elevant, and **T**ime-Bound. Setting such targets requires a reliable baseline of emissions and a robust system for estimating and tracking avoided or abated emissions. Such SMART targets are more challenging for adaptation than mitigation. However, countries are urged to consider targets such as the number of beneficiaries whose vulnerability would be reduced through built environment resilience measures, or the amount of square footage that would be designed and constructed using more climate-informed planning.

In addition, NDCs should set quantitative GHG emissions reduction targets (e.g., a percentage reduction by 2035) for the buildings sector (as a subset of the national NDC mitigation targets under the energy emissions category) irrespective of their level of market maturity and a country's contribution to global GHG emissions.

The "Menu" to choose from (42 policy options, under the eight types or categories of measures)

1. Building Energy Codes

Updating building energy codes and tailoring them to climate zones ensures that new buildings meet high energy efficiency and environmental standards. Design-based codes promote safe, low-emission buildings. Addressing embodied carbon and climate risk in codes supports national climate goals by reducing emissions and improving adaptation.

	Policy Options	Market Maturity		
		I.	II.	III.
A	Adopt and implement **design-based codes** for new buildings to provide safe, thermally comfortable, and optimal indoor air quality, while reducing emissions during operation. Tailor the codes to specific climatic zones with focus on passive design strategies.	x		
B	Adopt and implement **design-based codes** for new buildings to reduce embodied carbon using life-cycle analysis.		x	
C	Adopt and implement **design-based codes** for new buildings to target adaptation by setting standards that incorporate climate resilience and environmental considerations.		x	
D	Adopt and implement **performance-based codes** for existing buildings by establishing criteria that focus on enhancing energy efficiency and sustainability.		x	
E	**Expand the building code to target net zero carbon** while addressing resilience and equity issues over the lifecycle of the building.			x

2. Efficient Appliances, Building Systems, and Thermal Comfort Solutions

Promoting energy-efficient appliances through standards, incentives, and labelling is key to reducing energy use. Supporting high-efficiency appliances, repair rights, and affordable technologies can lower energy demand and emissions. A range of building design features can also help achieve this.

	Policy Options	Market Maturity		
		I.	II.	III.
A	**Promote the use of energy efficient appliances** by offering incentives, raising awareness, and setting performance standards.	x		
B	**Design and implement appliance labelling programme** to improve water and energy efficiency, and reduce emissions.	x		
C	Introduce **Minimum Energy Performance Standards (MEPS)** to phase out poor performing technologies from the market and drive demand for clean efficient technologies. Increase he scope and stringency of the standards over time.		x	
D	**Work with the industry to promote manufacturing / import of efficient appliances** by setting performance standards and providing incentives for manufacturing of energy-efficient technologies.	x		
E	**Enforce policies that support the 'right to repair,'** allowing consumers to fix and maintain products, and establish **'producer liability,'** holding manufacturers accountable for the durability and repairability of their products.			x

F	**Create innovative financial mechanisms** to support the purchase of efficient appliances to lower the cost of energy-efficient technologies.	x		
G	**Integrate low-carbon heating and cooling methods** in building design and operations, including passive design cooling.		x	

3. Building Performance Labelling and Certification

Performance labelling and certification ensure transparency and accountability in building energy performance. Intention-based certifications assess projected emissions for new buildings, while performance-based ones evaluate actual energy use in existing buildings. Including adaptation and biodiversity ensures positive environmental and social outcomes. These systems support NDC targets by promoting energy efficiency and optimal resource use.

	Policy Options	Market Maturity		
		I.	II.	III.
A	Adopt and implement **design-based certification** for new buildings based on calculated emissions from their operations.	x		
B	Adopt and implement **intention-based certification** for new buildings to target adaptation by setting standards that assess and ensure climate readiness.		x	
C	Adopt and implement **performance-based certification** for existing buildings. The certification should be based on performance metrics that are objective, verifiable, transparent, and directly relate to Sustainable Development Goals (SDGs) and emission reduction.		x	
D	**Expand the scope of certification to include adaptation** by integrating it into existing certification processes.		x	
E	**Gradually raise minimum building performance standards** in order to achieve greater energy efficiency and reduce overall environmental impact.		x	

4. Building Retrofits

Retrofitting existing buildings is essential for cutting emissions. Mandatory audits, thermal upgrades, and deep renovations reduce energy consumption and improve resilience, supporting NDC targets by addressing inefficiencies in older buildings.

	Policy Options	Market Maturity		
		I.	II.	III.
A	**Make periodic energy audits mandatory** for non-residential buildings based on building type, size and emissions.	x		
B	**Promote thermal modernisation of buildings** by upgrading insulation, installing energy-efficient windows, and enhancing building envelopes to reduce heat loss and improve energy performance.		x	
C	**Increase structural robustness to make buildings resilient** through sensible use of advanced materials and robust building codes, conducting regular assessments, and applying robust design standards to withstand environmental stresses.		x	

D	**Promote deep energy renovation** by performing comprehensive upgrades to building systems, improving insulation, and incorporating renewable energy technologies to significantly reduce energy consumption and enhance overall efficiency.			x
E	**Strengthen existing housing stock for thermal comfort, longevity, adaptation and resilience** by upgrading insulation, improving structural integrity, and enhancing climate resilience.		x	

5. Electrification, renewable energy, and grid integration

Distributed energy resources like rooftop solar and wind enhance energy independence and reduce emissions. Integrating decentralised energy storage and smart controls boosts efficiency and grid resilience, supporting NDC goals through renewable energy and better energy performance.

	Policy Options	Market Maturity		
		I.	II.	III.
A	**Promote decentralised renewable energy systems**, such as rooftop photovoltaic (RTPV), wind, and geothermal technologies to enhance energy independence, reduce carbon emissions, and support sustainable development.	x		
B	**Promote decentralised energy storage** by deploying Battery Energy Storage Systems (BESS), and thermal energy storage (e.g. solar water heater, phase change materials).		x	
C	**Promote the use of heat pumps** for space heating, water heating, and cooling by adopting energy-efficient models, integrating them into residential and commercial buildings, and using renewable energy sources to power them.		x	
D	**Use smart controls and grid interactive buildings** by implementing advanced building management systems, integrating real-time energy monitoring, and optimizing energy consumption through automated adjustments.		x	
E	**Promote the use of mixed energy sources** for a variety of uses such as combined heat production, municipal heating systems, and hydrogen for transportation fuel.		x	

6. Construction Methods and Processes

Improving construction methods reduces environmental impact. Techniques like optimizing materials, minimizing disturbance, and using modular technologies lower waste and resource use, supporting NDC goals by enhancing efficiency and sustainability.

	Policy Options	Market Maturity		
		I.	II.	III.
A	**Reduce waste during construction** by optimizing material use and recycling.	x		
B	Create guidelines and policies for adopting **environmentally responsible construction practices** like preservation of soil and natural features, minimise disturbance to vegetation, reduce consumption of water and energy, noise, dust, and pollution.		x	
C	**Use modular construction technologies** by using prefabricated components and efficient assembly methods.	x		

7. Materials and Circularity

Addressing building materials means transitioning away from a 'take, make, waste' paradigm to an 'avoid, shift, improve' model (Partnership for Energy Efficiency in Buildings (PEEB), 2021). A circular economy offers much promise towards decarbonizing buildings (GlobalABC, 2023). The use of low-carbon materials (particularly cement and steel) and adaptive, sustainable materials enhances decarbonisation and resilience, respectively, and can support NDC goals by embedding climate responsiveness in buildings that will exist and operate for several decades to come.

	Policy Options	Market Maturity		
		I.	II.	III.
A	Create policies to prioritise renovation and **incentivise adaptive re-use of existing buildings to extend building life**.		x	
B	Develop and implement programme for repair, reuse, recycling and safe disposal of building components and materials.		x	
C	**Reduce the use of materials that are responsible for high emissions** by selecting low-emission alternatives and reusing building and construction materials (especially low-carbon cement and steel).		x	
D	Promote and develop the use of local, vernacular, and environmentally friendly materials by sourcing and innovating within local and regional communities.	x		
E	**Use reusable, durable and adaptable construction materials** that can withstand changing conditions and evolving needs.		x	
F	**Use life cycle assessment** to evaluate which building materials (including bio-based and geo-based alternatives) can be used.			x
G	**Promote clinker reduction and use of alternative fuels** for cement and concrete by adopting greener production methods or procuring greener cement.	x		

8. Urban Planning for Adaptation and Resilience

Urban planning for climate mitigation and adaptation is crucial for embedding decarbonisation in the built environment and managing risk. Engaging communities, preparing for extreme events, and promoting nature-based solutions can enhance sustainability and resilience, while also contributing to NDC goals.

	Policy Options	Market Maturity		
		I.	II.	III.
A	**Integrate climate change adaptation and mitigation into urban planning** and infrastructure development by incorporating climate scenario planning, long-term strategies, evaluating climate risks, and designing resilient infrastructure.		x	
B	**Prepare to deal with extreme events and disasters** by developing contingency plans, investing in early warning systems, and implementing adaptive measures for heat waves, floods, water shortages, storms, and air quality issues.	x		
C	**Subscribe to nature-based infrastructure and solutions** by employing green roofs, urban forests, sponge city and permeability solutions, and wetland restoration to enhance ecological resilience and environmental sustainability.	x		

D	**Implement policies to revitalise and redevelop neighbourhoods**. Relocate residential areas in climate-affected zones where absolutely necessary.		x	
E	**Implement climate change-informed zoning reforms** that allow for higher-density developments and mixed-use buildings, which can include affordable housing options.	x		

Step 4: Ensure Enabling Conditions for NDC Implementation

STEP 4

Put in place the **necessary enablers** to translate the chosen measures into action

One of the biggest gaps in existing NDCs – not only on buildings – is the lack of attention to actioning the chosen commitments. Most NDCs do not back up substantive and technical measures with the support needed to actualise and achieve them. This includes the absence of critical funding and implementation arrangements, as well as capacity building and inclusive processes.

Another major oversight in the current generation of NDCs is the process through which the committed measures are formulated, chosen, and then delivered. Due to a lack of adequate public participation and consultation, NDC measures may fail to secure buy-in from local communities and stakeholders. Without bringing along the majority of the actors in the built environment value chain, NDC measures do not generate a sense of ownership, which in turn significantly undercuts the chances of success and achieving the intended results.

There is a recognition amongst sector experts that enablers are just as crucial to the NDCs as the substantive, technical measures, and that countries must bolster NDC measures with enabling mechanisms.

While the policy options (above) are the climate actions that countries would include in the NDCs as commitments (i.e., interventions that would have a direct impact on climate mitigation and adaptation), the enablers are typically measures that countries may not explicitly include as commitments in the NDC, but ought to be clearly and visibly affirmed in an accompanying NDC roadmap, or an NDC implementation plan, or even included in the NDC's technical annex.

Based on a survey of literature from this sector as well as expert recommendations from a series of interviews, this guide provides below a "menu of enablers", grouped into five categories.

1. Finance and Incentives
2. Awareness and Capacity-Building
3. Inclusion, Equity and Justice
4. Enforcement and Governance
5. Digitisation and Monitoring, Reporting and Verification (MRV)

Similar to the policy options in Step 3, countries can select a combination of enablers they deem most suitable. For ease of selection based on market maturity level (i.e., the three stages: Building Foundations; Expanding and Enhancing; and Achieving Net Zero and High Resilience), **the 27 enablers have also been tagged as most relevant to one of the three stages of market maturity, based on likely entry point for first introduction.**

Once more, it bears mentioning that any enabler may be relevant to more than one stage or market maturity, and may be applicable in most or even all countries. The identification (with an "X") in this guide merely represents the stage of market maturity where such an enabling mechanism is most likely to have its initial entry point. If the enabler has not already been introduced, and is novel in any country (be it a Stage II or Stage III country), then it certainly remains relevant for adoption as a new enabler for the 2025 NDC.

1. Finance and Incentives

Financial mechanisms are vital for making climate solutions viable and affordable. Green funds, financial literacy, and carbon pricing support climate mitigation and adaptation projects. Expanding green finance aligns investments with NDC goals for a low-carbon economy.

	Enablers	Market Maturity		
		I.	II.	III.
A	**Create green financing mechanisms** (e.g., green funds) for building owners and developers to invest in energy efficiency, energy-conservation, and energy-smart technologies.	x		
B	**Catalyse more concessional finance** for business incubation and acceleration for enterprises focused on technology innovation in supply chains for building material, supplies, and appliances.		x	
C	**Adopt market mechanisms** (such as carbon pricing, and emissions trading) by implementing policies that set financial values on carbon emissions, promoting market-based solutions to reduce greenhouse gases from the built environment.			x
D	**Expand access to green finance** by offering financial products that support environmental projects (particularly guarantees and green bonds), providing risk mitigation tools, and facilitating investment in sustainable development initiatives. These can also include incentives such as tax credits and consumer rebates.		x	
E	**Enhance public funding to support research** on integrated design, building materials, construction technology, use patterns and behaviour change to support all technical measures towards decarbonisation.		x	

2. Awareness and Capacity Building

Education and training are key to NDC implementation. Campaigns, curricula updates, and specialised training enhance skills, promoting more effective and informed climate action. Access to climate data strengthens evidence-based decision-making and policy effectiveness.

	Enablers	Market Maturity		
		I.	II.	III.
A	Invest in built environment-focused climate mitigation and adaptation awareness by funding educational campaigns, community workshops, and public outreach programmes for all. Raise public awareness of building codes, labelling, and certification.	x		
B	**Include climate change in engineering and architecture curricula in universities** by updating courses and fostering interdisciplinary research. **Establish / update curricula** for academic and vocational training on climate-friendly processes for the nearly CO_2-neutral production of building materials.	x		
C	Promote livelihood and training to improve the adoption of new technology and materials to enhance overall construction quality and sustainability. Build capacity of industry professionals, manufacturers, construction workers, and suppliers	x		

D	**Enhance financial literacy and capacity building** by offering targeted training programmes, providing educational resources, and developing tools to improve understanding of life cycle assessment, financial management and investment in sustainability.	x		
E	**Improve access to data on embodied carbon in materials** through robust life-cycle databases and readily available information for stakeholders.		x	
F	**Establish a sustainable construction oversight body** (e.g., a council or association) to identify, oversee and implement the skills and training needs of the built environment, enhancing the quality and reliability of construction practices.	x		

3. Inclusion, Equity and Justice

Climate policies must address equity and inclusivity. Low-carbon affordable housing, accessibility, and culturally sensitive policies promote social equity. Green finance explicitly targeted at vulnerable communities supports NDC goals by ensuring the fair distribution of climate benefits.

	Enablers	Market Maturity		
		I.	II.	III.
A	**Prioritise public participation and ensure inclusive decision making at all levels** by engaging diverse stakeholders, facilitating open forums, and incorporating feedback into policy development, by tracking the participants in these processes using data segregated by gender, age, and Indigenous Peoples and Local Communities (IPLCs).	x		
B	**Design policies and strategies** that provide **a wide range of housing options** to meet the social, economic, and environmental needs of diverse users, rather than adopting a 'one-size-fits-all' approach. This will include low carbon affordable housing for owners, renters and short-term migrant population.	x		
C	**Create dedicated funding channels of green finance for vulnerable communities** (for instance, through the allocation of certain quantities of funding for climate-responsive and sustainable building projects in communities at higher risk from climate hazards)			x
D	**Embed creation of green local jobs** as part of an equitable energy transition process.		x	
E	**Make the reduction of energy poverty and the achievement of universal electricity access a central goal i**n built environment related guidelines and rules, to mainstream these considerations within built environment initiatives and programmes.	x		
F	**Promote the integration of indigenous knowledge** in building and urban planning practices, especially in areas with distinct cultural heritage or significant Indigenous populations.		x	

4. Enforcement and Governance

Strengthening governance and enforcement ensures effective climate policies. Building capacity, fostering partnerships, and integrating climate-proofing measures drive coordinated climate actions, supporting NDC targets through more effective institutional action and harmonisation.

	Enablers	Market Maturity		
		I.	II.	III.
A	**Increase technical capacity of government officials** by offering targeted training programmes and developing skills across key sectors for implementing agencies and decision makers.	x		
B	**Address fragmentation of governance** by promoting coordination and collaboration among various agencies and stakeholders.		x	
C	**Encourage public-private partnerships** by fostering collaboration between government entities and private organisations for shared goals.		x	
D	Incorporate and maximise **climate-proofing measures into public funding and procurement mechanisms** by integrating mitigation and adaptation requirements.			x
E	**Align climate strategies** with existing projects for greater impact, such as urban planning, affordable housing, and mobility infrastructure.	x		
F	**Promote and harness industry leadership** by encouraging companies to adopt good best practices and lead by example in sustainable development.		x	

5. Digitisation and MRV

Enhancing digitisation and MRV practices ensures transparency in climate actions. Improved data libraries, monitoring systems, and carbon data disclosure support NDC implementation by providing accurate metrics and accountability for climate progress.

	Enablers	Market Maturity		
		I.	II.	III.
A	Develop and disseminate a strong **data library and case studies** of materials and construction practices.	x		
B	**Ensure wider access to data and information** by developing open databases and promoting easy online access for all stakeholders.		x	
C	**Improve Measurement, Reporting and Verification** (MRV) and Measurement, Education, Research and Learning (MERL) frameworks by enhancing methodologies and implementing robust systems for accurate assessments.		x	
D	**Increase public disclosure of embodied carbon data through regulation, codes, and policies** by enforcing transparency requirements and encouraging comprehensive reporting practices.		x	

Step 5: Check if the NDC is Ambitious, Investable, Actionable, and Inclusive

STEP 5

Check to ensure the NDC measures committed to are **ambitious, investable, actionable, and inclusive**

This guide offers a step-by-step guidance to make the NDC content for the built environment **ambitious, investable, actionable, and inclusive.** The checklist below helps decision-makers to determine if the NDCs are fit for purpose or if there is room for improvement.

While the checklist for 'Ambitious' largely relates to the public-facing content presented in the NDC, i.e., the policy options that are chosen as commitments (and helps answer the question, "Does the NDC reflect this?"), the checklists for 'investable,' 'actionable,' and 'inclusive' point to what the NDC commitments should be informed or shaped by (and help answer the question, "Is the NDC supported by this?")

A. Ambitious

		Does the NDC Reflect This?	Complexity
☐	Scalability and Replicability	Include policy options that are achievable now, but that can clearly be scaled up over time, particularly in low-income regions, and replicated more broadly, ensuring solutions grow in ambition as capacity develops (e.g., a green or low-carbon precinct or district that could be scaled up to a green city, and then replicated in green cities elsewhere).	Quick Win
☐	Net-Zero Compatible Targets	Include clear targets for 2035 that are consistent with a future net-zero pathway, so that NDC measures can contribute to a long-term net-zero pathway, with specific timelines and benchmarks.	Quick Win
☐	Circular Economy	Include policy options that prioritise the use of low-carbon and locally available sustainable materials like low-carbon steel, cement, timber, and other bio-based materials, and promote efficient processes that reduce waste and support a circular economy.	Moderate Challenge
☐	Mitigation and Adaptation	Include policy options that combine mitigation and adaptation, addressing both simultaneously, integrating climate-resilience decarbonisation.	Moderate Challenge
☐	Comprehensive Coverage	Include policy options that cover both existing and new buildings, addressing energy use, water, waste, and appliances to ensure a holistic approach across the built environment.	Transformational Change
☐	Cross-Sectoral Approach	Include policy options that recognise the built environment's links to sectors like electricity, water, and waste. Include policy options that address these interconnections for maximum impact.	Transformational Change

B. Investable

		Does the NDC Reflect This?	Complexity
☐	Finance Estimates	Include directly in the NDC estimates of finance required for the achievement of each measure.	Quick Win
☐	Strong Business Case	Make a basic business case for financing the NDC by demonstrating how finance can enable the policy options to 'pay for themselves,' in ways applicable in the local market.	Quick Win
☐	Cost-effectiveness	Underpin the measures with a reasonable costing methodology and, where possible, cost-benefit analyses.	Moderate Challenge
☐	Data and Evidence	Ensure that the costing and financial models for each of the policy options are based on robust data and evidence from the market. This will help increase investor confidence.	Moderate Challenge
☐	Flexibility for Finance	Develop an NDC investment plan that includes both traditional finance instruments but also more innovative and creative financial instruments, to be able to tap into a broader range of financial sources and types.	Transformational Change

C. Actionable

		Does the NDC Reflect This?	Complexity
☐	Targets and Timelines	Include directly in the NDC interim (2030) and end-term (2035) targets for each policy option, to set a clear timeline for action	Quick Win
☐	Assignment of Responsibility	Identify in the NDC the key agency or department or ministry or other institution that will be mainly responsible for implementation of each policy option, as well as other entities who will support. This will create accountability.	Quick Win
☐	Policy Harmonisation	For ease of integration into national, sub-national, and sectoral implementation, frame policy options to be as aligned as possible with existing policymaking, planning, and programmes.	Quick Win
☐	Inter-sectoral coordination	Identify the institutional arrangements for implementation, including mechanisms for cross-sectoral (e.g., inter-ministerial / inter-departmental coordination)	Moderate Challenge
☐	MRV and M&E	Supplement the NDC with a customised monitoring, evaluation, research, and learning mechanism (MRV for mitigation, M&E for adaptation) to help collect data on performance and results.	Moderate Challenge

D. Inclusive

		Does the NDC Reflect This?	Complexity
☐	Consultation and Public Participation	Communicate directly in the NDC how the policy options selected are a product of public participation and consultation, such as through stakeholder engagement processes.	Quick Win 
☐	Appropriateness	Ensure that the NDC preparation process is equipped to consider policy options suitable for the country context, including the state of advancement or maturity of the built environment, the country's and sector's contribution to greenhouse gas emissions, and availability of technical capacity, human capital, and finance.	Quick Win 
☐	Affordability	Ensure that the NDC preparation process for the built environment embeds the recognition of shelter as a human right and the need for everyone to live with dignity and security. Mandate that the NDC preparation process should maintain affordability of buildings for the majority.	Moderate Challenge 
☐	Gender Responsiveness	Ensure that the NDC preparation process accounts for the disproportionate impacts on women and marginalised gender identities, and is mandated to focus on policy options that provide clear and attributable gender benefits.	Transformational Change 

5 Blueprint for NDC Measures and Helpful Resources

The following blueprint offers a possible model for formulation and presentation of NDC content for the built environment, for the 2025-2035 NDCs. All the content in this is purely illustrative.

This could be adapted and expanded by each individual country to suit their own NDC template and their approach to sectoral and sub-sectoral NDC content. This is offered here to assist with NDC development, as needed.

[Guidance notes for NDC authors are provided *in italics, in bold grey text*. Items highlighted in blue are for the authors to fill in when developing their own country's content].

5.1 Blueprint for NDC Section on the Built Environment (Buildings and Construction)

---Start by dedicating a section or chapter in the NDC to the built environment / buildings and construction---

Section X : Buildings and Construction
Economic activity in the buildings and construction sector contributes XX% to national GDP. The sector accounts for YY% of the population employed. The sector has been growing at a rate of ZZ% annually in the last ABC years, with the largest growth witnessed in the [residential / commercial / institutional] sub-sector at X% per annum, followed by the [residential / commercial / institutional] sub-sector at Y% per annum.
US$ XYZ dollars were invested in the buildings and construction sector between (year) and (year), with the public sector investing A% of this, amounting to US$ X dollars, and the private sector investing B% of this, amounting to US$ Y dollars.

---Give general introduction to state of buildings in country and outline overall targets for sector---

Mitigation: Buildings Sectoral Base Year and 2035 Target
In 20XX, [country name's] building sector was responsible for XX MtCO2e, mainly arising from energy and electricity consumption in buildings. Consequently, the country seeks to reduce emissions in the buildings sector by XX% to XX MtCO2e by 2035 compared to the 20XX base year. This is an ambitious target considering that [insert reason, e.g., a trend that drives Gross Floor Area (GFA) and need for housing in Country].
Adaptation: Buildings Sectoral Base Year and 2035 Target
In 20XX, [country name's] building sector suffered damage worth US$ XXX dollars as a result of extreme weather events and climate-induced disasters. This reflects an increasing trend over the last [ABC] years. Consequently, the country seeks to reduce climate-driven damage to the buildings sector by XX% by 2035 compared to the average annual losses in the last five-year period between [year] and [year]. This is a challenging target considering that [insert reason, e.g., trends of more of the population migrating to low-lying coastal areas or the growth in new property development in flood-prone or other at-risk areas, etc.].

---Outline current policy landscape of climate change mitigation and adaptation in buildings---

Existing Policy Levers in [Country Name]
In 20XX, [Country Name] mandated building codes for new [residential//non-residential/public/commercial/institutional] buildings that require minimum energy efficiency requirements in the design and construction of a range of building features and components, including heating, cooling, insulation, lighting, and equipment. [Provide example:] In 20YY, the new XX Guidelines / Rules / Notification / Directive add to these efforts by extending further energy efficiency design specifications for existing [residential//non-residential/public/commercial/institutional] buildings, requiring retrofits to buildings above [enter relevant threshold]. The Guidelines/Rules/Notification/Directive also calls for continuously monitoring, analysing, and optimising energy consumption, starting from 20XX.

In 20XX, [Country Name] mandated zoning rules for [residential//non-residential/public/commercial/institutional] buildings that prevent new building and constriction in high flood risk zones as mapped by the government [name of Ministry / Department / Authority]. The national disaster risk reduction and disaster risk management policy / strategy of [year] includes the buildings sector as a priority area and articulates the following provisions: [capture what the relevant national or sectoral policy / strategy /plan / framework states].

---Provide an account of what progress was made on the country's first (2019 / 2020 / 2021) NDC ---

The first NDC did not identify a specific GHG mitigation target for the buildings sector, within the broader target for the energy emissions category. The NDC included the following measures to achieve mitigation in the buildings sector: [note what the first NDC contained on buildings and construction / the built environment.] These commitments have been partially achieved. [Elaborate on actions or measures that were successful]. Most notably, the XYC programme was successfully launched, and now covers [scope or range of application, e.g., percentage of buildings]. The commitment to [ABC] did not materialise due to [provide reasons], but progress continues to be made towards [relevant goal or objective].

The first NDC did not discuss adaptation in the context of the buildings and construction sector.

---List case studies / good practices in country ---

Selected Examples of Current Decarbonisation Initiatives
The recent mixed-use developments in [Country name], such as XX City and established districts like XX and XX, exemplify the nation's shift towards a low-carbon, climate-resilient buildings and construction sector. For instance, XX City has implemented XX MW of solar PV across all buildings on the site and features XX buildings with [list sustainability features].

New Policy Options (Measures) to Close the Gap Towards the More Ambitious 2035 Target

--- This is the section in which to state and describe the new or updated NDC commitments in 2025, for the built environment.

Fill out and populate the table structure that follows, to list and expand on the policy options that the country is going to commit to for 2025 - 2035 -

In this section of the NDC blueprint, any country can adopt the following suggested structure (with country-relevant modifications, as necessary) and list the country's selected policy options (either under separate categories for mitigation and adaptation, or – preferably – a single, integrated list). Examples of policy options are provided under Step 3 of this guide. The policy options would be chosen to increase the level of ambition and would be accompanied by further detail on implementation, finance, and participation, to ensure that the NDC also incorporates the enablers from Step 4 of this guide.

The format suggested below will automatically facilitate the consideration of elements that result in the four hallmarks being reflected (ambitious, investable, actionable, and inclusive). This allows for greater structural consistency in capturing built environment measures across various countries' NDCs. At the same time, with countries gauging their own level or market maturity for the built environment and choosing context-relevant sets of policy options and enablers, the content that each country would populate into this structure would be markedly different, and developed at a level of detail that is appropriate for national circumstances.

Finally, the last three columns can be (internally, not for formal submission as part of the final NDC to the UNFCCC) cross-checked to ensure that the combination of all measures in the NDC covers a range of quick wins, moderate challenges, and transformative changes for each country (per Step 5 of the guide). Having such a combination allows for each country to make progress and achieve results consistently throughout the ten-year NDC period.

A. Example (with illustrative content) for a Stage I country: market where no mandatory building standards exist yet

Measure	Interim (Mid-Term) Target (for 2030)	Terminal (End-Term) Target (for 2035)	Institution / Agency Responsible for Implementation	Other Coordinating Institutions or Agencies	Reporting Mode	Estimated Finance Needed	Quick Win	Mod-erate Chall-enge	Trans-forma-tional Change
Adopt and implement a mandatory code for whole buildings, plus building systems and components (such as an electrical, mechanical, plumbing, safety), and for regulating construction and materials.	Design-based standards developed – through participatory input of all stakeholders - and applied to large new commercial and residential buildings.	Design-based standards developed through participatory input of all stakeholders - and applied to all new commercial and residential buildings; modified standards also developed for retrofits for *existing* buildings.	Ministry / Department of Energy	Ministries / Departments of Housing, Urban Development, Environment, Finance	Biennial Update Report (BUR)	US$ XX	✓		

B. Example (with illustrative content) for a Stage II country: market where only prescriptive (design-based) buildings standards exist

Measure	Interim (Mid-Term) Target (for 2030)	Terminal (End-Term) Target (for 2035)	Institution / Agency Responsible for Implementation	Other Coordinating Institutions or Agencies	Reporting Mode	Estimated Finance Needed	Quick Win	Mod-erate Chall-enge	Trans-forma-tional Change
Adopt and implement performance-based building standards for energy, water, and other relevant resources, for all buildings, requiring 10% improvement over the baseline, which is to be revised every two years	Performance based standards developed – through participatory input of all stakeholders - and applied to large municipal, residential, commercial, and industrial buildings	Performance based standards developed through participatory input of all stakeholders - and applied to all new *and existing* buildings	Ministry / Department of Energy	Ministries / Departments of Housing, Urban Development, Environment, Industry, Finance	Biennial Update Report (BUR)	US$ XX		✓	

C. Example (with illustrative content) for a stage III country: market that already has performance-based buildings standards

Measure	Interim (Mid-Term) Target (for 2030)	Terminal (End-Term) Target (for 2035)	Institution / Agency Responsible for Implementation	Other Coordinating Institutions or Agencies	Reporting Mode	Estimated Finance Needed	Quick Win	Mod-erate Chall-enge	Trans-forma-tional Change
Expand existing performance-based energy, water, and other relevant codes to include embodied carbon and adaptation metrics, for all buildings, and requiring 15% improvement over the baseline, which is to be revised every two years	Performance based standards developed – through participatory input of all stakeholder - and applied to large municipal, residential, commercial, and industrial buildings	Performance based standards developed – through participatory input of all stakeholders - and applied to all new *and existing* buildings	Ministry / Department of Energy	Ministries / Departments of Housing, Urban Development, Environment, Industry, Finance	Biennial Update Report (BUR)	US$ XX			✓

In doing so, the above three examples of NDC measures reflect the recommended hallmarks: Ambitious (in the case of a stage 1 country, introducing mandatory standards where none exist; in the other two cases a 10-15% improvement and updating of baseline every two years); Investable (clear estimation of finance required, which would be derived from costing exercises); Actionable (clear identification of implementation responsibilities, and phasing of roll-out between interim target and terminal target); and Inclusive (as the mid-term and interim targets are worded to explicitly include public participation).

5.2 Additional Resources to Refer to and Draw from When Developing the NDC

Exemplary NDCs That Are Useful Models for Content on the Built Environment

1 **United Arab Emirates (UAE), Third Update of Second NDC (2023)**

The UAE's NDC includes a dedicated section on the buildings sector, outlining specific targets and measures for reducing emissions. The document sets an ambitious target to reduce emissions in the buildings sector by 56% to 27 MtCO2e by 2030 compared to the 2019 base year level of 62 MtCO2e. This is particularly notable given the expected 14% population growth during this period, which will drive strong demand for new buildings.

The NDC outlines several specific policy measures and initiatives for the buildings sector. These include periodic updates to existing building codes to increase the efficiency of new buildings, retrofitting of inefficient buildings, and increased penetration of efficient cooling, rooftop PV, and solar water heating. The UAE has introduced a national building code setting minimum energy efficiency standards for all emirates. At the emirate level, Dubai, Abu Dhabi, and Ras Al Khaimah have established dedicated green building regulations and set targets for building retrofits. For example, Dubai aims to retrofit 30,000 buildings by 2030. The document also mentions plans to accelerate the installation of solar thermal and efficient cooling systems, introduce building energy labels, and implement pricing reforms for residential, commercial, and industrial power consumption to encourage energy conservation.

This NDC provides a good example of comprehensive content on the buildings and construction sector. It includes a quantified emissions reduction target for the sector, as well as specific policy measures and initiatives at both the federal and emirate levels. The document addresses both new construction and existing buildings through building codes and retrofit programmes. It covers various aspects of building energy use, including cooling, renewable energy integration, and energy efficiency standards.

While the NDC focuses primarily on mitigation measures for the buildings sector, it also mentions adaptation considerations, such as the need for climate-resilient infrastructure. The combination of clear targets, specific policy measures, and coverage of multiple aspects of the sector makes this a strong example of building sector content in an NDC.

2 **Türkiye, Updated First NDC, 2022**

Türkiye's NDC contains a dedicated section on the buildings sector, which outlines several specific measures and targets for reducing greenhouse gas emissions and improving energy efficiency in buildings. The document highlights Türkiye's progress towards low-carbon development in the buildings sector, primarily through energy efficiency and renewable energy initiatives.

Key measures mentioned include the implementation of Energy Performance Certificates (EPCs) for buildings, the introduction of Nearly Zero Energy Building (NZEB) concepts, and specific targets for renewable energy usage in buildings. For instance, by 2023, buildings over 5000 m² must have an EPC with at least a "B" class rating, and renewable energy sources must supply at least 5% of the building's total primary energy consumption. By 2025, these requirements extend to buildings over 2000 m², with renewable energy sources needing to supply at least 10% of the building's total primary energy consumption.

The NDC outlines several mitigation policies for the buildings sector up to 2030, including renovating existing buildings, constructing more energy-efficient buildings, using district heating solutions in densely populated areas, and promoting integrated building design and Building Information Modelling (BIM). It also mentions plans to increase renewable energy self-consumption, implement building performance codes and standards, and increase the use of energy-efficient appliances and technologies.

This NDC provides a good example of content related to the buildings and construction sector due to its comprehensive approach. It addresses both new construction and existing buildings, includes quantifiable targets (e.g., specific EPC ratings and renewable energy percentages), and covers a wide range of measures from energy efficiency to renewable energy integration. The document also touches on both mitigation and adaptation aspects, mentioning the need for climate-resilient urban development. While it could benefit from more specific, measurable targets for some of its initiatives, the NDC demonstrates a clear focus on the buildings sector as a key area for climate action in Türkiye.

3 **Colombia, Updated First NDC, 2020**

Colombia's NDC includes specific measures for the buildings sector under both mitigation and adaptation:

Mitigation:

- Sets a target to implement energy efficiency measures in 25% of residential buildings and 40% of commercial and public buildings by 2030
- Aims to achieve net-zero deforestation in new housing projects by 2030
- Plans to implement sustainable construction criteria in all new buildings by 2030

Adaptation:

- Includes a goal to incorporate adaptation criteria in housing and human settlement planning instruments
- Aims to strengthen the adaptive capacity of human settlements through eco-urbanism and construction strategies
- Plans to develop and implement a national strategy for climate-resilient informal settlements

Colombia's NDC is notable for its balanced approach to both mitigation and adaptation in the buildings sector, providing quantifiable targets and a range of specific measures. It addresses various aspects of the sector, including energy efficiency, sustainable construction, and climate-resilient planning.

This NDC is a strong example due to its comprehensive coverage of the buildings sector, inclusion of both mitigation and adaptation measures, and specific, quantifiable targets. It also links buildings sector actions to broader national development goals, demonstrating an integrated approach to climate action and sustainable development.

Guides for Effective Climate Action in the Built Environment – By Topic

MITIGATION

UNFCCC (2021), *Compendium on Greenhouse Gas Baselines and Monitoring: Building and Construction Sector.* https://unfccc.int/sites/default/files/resource/UNFCCC%20Compendium%20GhG%20Building%20Sector.pdf

GlobalABC (2019), *Adopting Decarbonisation Policies in the Buildings and Construction Sector: Costs and Benefits.* https://globalabc.org/sites/default/files/2020-06/GlobalABC%20Adopting%20Decarbonization%20Policies.pdf

GlobalABC (2021), *Decarbonising the Building Sector: 10 Key Measures.* https://globalabc.org/sites/default/files/2021-08/Decarbonizing%20The%20Building%20Sector%20-%2010%20Key%20Measures.pdf

ADAPTATION

GlobalABC (2021), *Buildings and Climate Change Adaptation: A Call for Action.* https://globalabc.org/sites/default/files/2021-02/Buildings%20and%20Climate%20Change%20Adaptation%20-%20FULL.pdf

GlobalABC (2021), *Buildings and Climate Change Adaptation: Adaptation of the Building Sector to Climate Change – 10 Principles for Effective Action*. https://globalabc.org/sites/default/files/2022-03/10%20principles%20EN%20v2_0.pdf

GlobalABC (2024), *Achieving Resilience in the Built Environment: Why Are We Not Adapting?* https://globalabc.org/sites/default/files/2024-03/GlobalABC-White%20Paper-Why%20are%20we%20not%20adapting-FULL.pdf

POLICY ROADMAPS AND CASE STUDIES

Buildings Breakthrough (2024), *Priority International Actions for 2024-2025* https://breakthroughagenda.org/wp-content/uploads/2024/05/Buildings-Breakthrough-Priority-International-Actions-2024.pdf

GlobalABC (2020), *Roadmap for Buildings and Construction 2020-2050: Towards a Zero-Emission, Efficient, and Resilient Buildings and Construction Sector.* https://globalabc.org/sites/default/files/inline-files/Global%20Roadmap_FINAL.pdf.

GlobalABC (2020), *Regional Roadmap for Buildings and Construction in Africa 2020-2050: Towards a Zero-Emission, Efficient, and Resilient Buildings and Construction Sector.* https://globalabc.org/sites/default/files/inline-files/GlobalABC_Roadmap_for_Buildings_and_Construction_in_Africa_FINAL2.pdf.

GlobalABC (2020), *Regional Roadmap for Buildings and Construction in Asia 2020-2050: Towards a zero-emission, Efficient, and Resilient Buildings and Construction Sector.* https://globalabc.org/sites/default/files/inline-files/Asia_Buildings%20Roadmap_FINAL.pdf.

GlobalABC (2020), *Regional Roadmap for Buildings and Construction in Latin America 2020-2050: Towards a Zero-Emission, Efficient, and Resilient Buildings and Construction Sector.* https://globalabc.org/sites/default/files/inline-files/GlobalABC%20Regional%20Roadmap%20for%20Buildings%20and%20Construction%20in%20Latin%20America.pdf.

CONSTRUCTION

IFC (2023), *Building Green: Sustainable Construction in Emerging Markets* https://www.ifc.org/content/dam/ifc/doc/2023/building-green-sustainable-construction-in-emerging-markets.pdf

PEEB (2021), *Embodied Carbon - A Hidden Heavyweight for the Climate: How Financing and Policy Can Reduce the Carbon Footprint of Building Materials and Construction.* https://www.peeb.build/imglib/downloads/PEEB_Building_Materials_Embodied_Carbon.pdf

MATERIALS

UN Environment Programme (2023), *Building Materials and the Climate: Constructing a New Future*. https://wedocs.unep.org/handle/20.500.11822/43293

GlobalABC (2020), *Roadmap for Buildings and Construction 2020-2050: Towards a Zero-Emission, Efficient, and Resilient Buildings and Construction Sector.* https://globalabc.org/sites/default/files/inline-files/Global%20Roadmap_FINAL.pdf.

GlobalABC, *Sustainable Building Materials Hub* https://globalabc.org/sustainable-materials-hub/home

EPFL https://www.epfl.ch/labs/lmc/research/

Centre for Worldwide Sustainable Construction https://cwsc.epfl.ch/about-us/research/

CIRCULARITY

UNEP, UNDP, UNFCCC (2023), *Building Circularity into Nationally Determined Contributions: A Practical Toolbox – User Guide,* https://www.learningfornature.org/wp-content/uploads/2023/10/Building-Circularity-into-NDCs_A-Practical-Toolbox-User-Guide-Final.pdf

WorldGBC (2023), *The Circular Built Environment Playbook.* https://worldgbc.org/wp-content/uploads/2023/05/Circularity-Accelerator-Playbook_2023.pdf

FINANCE FOR GREEN BUILDINGS

IFC (2019), *Green Buildings: A Finance and Policy Blueprint for Emerging Markets* https://www.ifc.org/content/dam/ifc/doc/mgrt/59988-ifc-greenbuildings-report-final-1-30-20.pdf

UNEP FI (2024), *Banking on Green Buildings: Background Materials to Build Capacities at Commercial Banks.* *https://www.unepfi.org/wordpress/wp-content/uploads/2024/04/PRB_Banking-on-Green-Buildings_final.pdf*

DATA

GlobalABC (2022), *The Building Passport: A Tool for Capturing and Managing Whole-Life Data and Information in Construction and Real Estate.* https://globalabc.org/sites/default/files/2022-06/GlobalABC_The%20Building%20Passport_FINAL_EN.pdf

TOOLS

IFC Edge https://edgebuildings.com/

IFC Buildings Resilience Index https://www.resilienceindex.org/

ALLIANCES AND PLATFORMS

Declaration de Chaillot https://www.ecologie.gouv.fr/sites/default/files/declaration-de-chaillot-forum-batiments-climat.pdf

Industrial Deep Decarbonisation Initiative https://www.cleanenergyministerial.org/initiatives-campaigns/industrial-deep-decarbonisation-initiative/

Council of Engineers for the Energy Transition https://www.unido.org/CEET

NDC DEVELOPMENT AND IMPLEMENTATION - Start-to-Finish 'How To' Guides

(Not specific to the built environment but helpful guides to better and stronger NDCs, which in turn supports enhanced NDC content on the built environment)

CDKN and Ricardo, *Planning for NDC Implementation – A Quick-start Guide.* https://ndc-guide.cdkn.org/

NDC Partnership (2023), *NDC Investment Planning Guide.*

https://ndcpartnership.org/sites/default/files/2023-12/ndc-investment-planning-guide-best-practice-guide2023.pdf

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International Energy Agency (IEA). (2022). *The Breakthrough Agenda Report 2022: Accelerating Sector Transitions Through Stronger International Collaboration.* https://iea.blob.core.windows.net/assets/49ae4839-90a9-4d88-92bc-371e2b24546a/THEBREAKTHROUGHAGENDAREPORT2022.pdf.

Intergovernmental Panel on Climate Change. (2022). *Sixth Assessment Report, Climate Change 2022: Mitigation of Climate Change, the Working Group III contribution.* IPCC, Working Group III on Mitigation of Climate Change. https://www.ipcc.ch/report/sixth-assessment-report-working-group-3/.

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United Nations Environment Programme (UNEP). (2024). *Global Status Report for Buildings and Construction 2023: Beyond Foundations - Mainstreaming Sustainable Solutions to Cut Emissions from the Buildings Sector.* Global Alliance for Buildings and Construction (GlobalABC). https://wedocs.unep.org/bitstream/handle/20.500.11822/45095/global_status_report_buildings_construction_2023.pdf?sequence=3&isAllowed=y .

United Nations Environment Programme (UNEP). (2024, March 7). *Not yet built for purpose: Global building sector emissions still high and rising*. Retrieved October 2024, from https://www.unep.org/news-and-stories/press-release/not-yet-built-purpose-global-building-sector-emissions-still-high#:~:text=At%20the%20same%20time%2C%202.4,that%20lack%20stringent%20building%20codes.