

# A GUIDE FOR INCORPORATING BUILDINGS ACTIONS IN NDCs

**Incorporating fundable buildings sector Green House Gas (GHG) emission mitigation actions in Nationally Determined Contributions (NDCs)**



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## BUILDINGS



## » LIST OF ABBREVIATIONS

**CMA:** Conference of the Parties serving as the meeting of the Parties to the Paris Agreement

**GBCs:** Green Building Councils

**GBPN:** The Global Buildings Performance Network

**GHG:** Greenhouse Gas Emissions

**GlobalABC:** The Global Alliance for Buildings & Construction

**GSR:** Global Status Report on Buildings & Construction

**IEA:** International Energy Agency

**INDC:** Intended Nationally Determined Contributions

**IPCC:** Intergovernmental Panel on Climate Change

**kWh:** Kilowatt-hour

**MRV:** Measurable Reportable & Verifiable Analysis or Data

**NAMA:** Nationally Agreed Mitigation Action

**NDC:** Nationally Determined Contributions

**PEEB:** Programme for Energy Efficiency in Buildings

**TEP-A:** Technical Examination Processes for Adaptation

**TEP-M:** Technical Examination Processes for Mitigation

**UN Environment:** The United Nations Environment Programme

**UNFCCC:** United Nations Framework Convention on Climate Change

**World GBC:** World Green Building Council

**WRI:** The World Resources Institute



## » SUMMARY FOR DECISION-MAKERS

The buildings sector contributes nearly 40% to global energy-related annual GHG emissions (IEA/UNEP, 2018). Final energy demand from buildings is predicted to increase 50% by 2050 compared with 2015 levels under business as usual scenarios due to rapid urbanisation and the doubling of the built surface area. Effective decarbonization of the buildings sector is therefore critical to meeting the Paris Agreement Goals and exceeding the current level of ambition in Nationally Determined Contributions (NDCs).

Only one-hundred and thirty-six (136) parties have referenced action required by the buildings and/or construction sector in their NDCs. Very few building sector actions included in these NDCs specify mitigation targets, and if fully implemented, currently cover only about 60% of building related GHG emissions (IEA/UNEP, 2018). **Very few actions describe targets to move to carbon neutral or net-zero energy building performance, which is necessary for the sector to be on a below 2°C pathway. Nor do they commonly communicate the potential co-benefits of proposed actions.**

*More needs to be done: The overarching challenge is to ensure all countries include building sector actions in their NDCs, that the ambition of existing building sector actions in NDCs is increased and effectively implemented in order to achieve the Paris agreement goals.*

More work is needed to increase the coverage and ambition of building sector climate actions. The current scope and ambition of buildings sector commitments are therefore, insufficient to meet the Paris Agreement goals. It is also evident that there is no consistent format being used to describe buildings sector actions in NDCs. This means that it is difficult to assess the scope, ambition and potential effectiveness of Parties commitments. Developing a common format for describing and comparing buildings sector actions in NDCs is therefore necessary.

**This guide is designed to address the urgent need for further extending the scope and ambition of building sector actions in NDCs**, the opportunities for aligning with commitments made by non-party actors, and the renewed support for successively increasing ambition and implementing actions of NDCs. It provides a simple process for incorporating or updating *ambitious* and *effective* building sector actions in Nationally Determined Contributions. It focusses particularly on key actions that are necessary to address and overcome common challenges faced by countries in designing, financing and implementing ambitious and effective actions, and is intended to support the progressive updating of NDCs

Building from existing policies and commitments, countries can extend the ambition of building sector actions by:

- Increasing the scope of existing building energy regulations to include a greater proportion of building types, particularly housing, and to renovation projects;
- Increasing energy performance standards for building envelopes, heating, cooling and ventilation systems, and appliances;
- Integrate building sector actions with urban land-use planning to enable the decarbonisation opportunities of sustainable mobility choices, reducing urban heat-island effects, and providing scale for integration of distributed renewable energy supply.

This guide is structured around three stages for incorporating such ambitious and effective buildings sector GHG mitigation actions into NDCs; Mapping, Prioritizing and Implementing & Monitoring. Each section focuses on *how to* achieve ambitious and effective outcomes in the buildings sector. You can dive into the guide at any point depending on your own circumstances. It also links with the evidence base on building sector actions, tools and resources offered by GlobalABC member organisations.

## MAPPING

**Goal:** The goal of the mapping phase is to have developed a clearly communicated status of existing building sector climate actions, established MRV baseline scenario and gap analysis that sets the evidence base for prioritising mitigation actions required to limit global warming to well below 2°C.

**Theory of Change:** Due to the fragmentation and diversity of the building sector it is important that national goals are informed by and adapted to local market conditions. The process of planning building sector climate actions for NDCs therefore requires a high degree of coordination between government agencies at national, regional and local levels in order to clarify roles and responsibilities and streamline the implementation of enabling policies. There also needs to be effective engagement with local businesses and communities in the construction value chain in order to understand local market barriers and opportunities that can inform policy and identify front-runners that can serve as champions for change.

**Approach:**

- Establish Mitigation MRV Baselines
- Map Existing Policies & Capabilities
- Develop Local Market Action Plans

## PLANNING

**Goal:** The purpose of prioritising is to identify key actions that work together to enable the buildings sector to decarbonise and contribute to the resilience and adaptive capacity of built environments.

**Theory of Change:** Increasing access to programmatic funding and finance for building energy efficiency, capacity building, emissions mitigation and adaptation actions is the primary means of support requested by countries. Therefore, while respecting that there will be many local, regional and national variations in context that will influence which actions are prioritised, how fundable a course of action is, can be adopted as a common criterion.

**Approach:** Prioritise actions that

- Have high mitigation and/or adaptation impact
- Are transformative & scalable (not a one-off project or program)
- Demonstrate a high level of stakeholder engagement and often commitment, with co-funding, leveraged private sector investment, and community in-kind support.
- Lead to measurable, reportable and verifiable outcomes (covered in Section 3).

## MONITORING & IMPLEMENTING

**Goal:** Develop an Implementation plan that is going to be effective in achieving building sector climate actions in NDCs and that meets the governance, financing and monitoring requirements of potential funders.

**Theory of Change:** A plan without a goal is but a plan; A goal without a plan is but a dream. Having identified the scope of existing building sector actions, and the prioritised high-impact actions that can bridge the ambition gap, a fundable process for implementation needs to be designed, communicated and monitored. It is critical that a decarbonization goal and milestones are established and that a lead agency is appointed to align responsibilities of agencies and jurisdictions in order to maintain progress and achieve the goal.

**Approach:** When developing fundable implementation plans for building sector climate actions you should consider the extent to which the implementation process:

**Governance:**

- Contributes to national and non-party actor priorities for low-emission buildings
- Builds from existing building climate policies and regulations to catalyze new policy and institutional changes
- Strengthens institutional and implementation capacity for decarbonizing the buildings sector
- Monitors, verifies and reports on the progress and impact of actions through open access knowledge sharing infrastructure.
- Plans for scaling up the scope and impact of the intended actions without equally increasing the total costs of implementation.

**Finance:**

- Strengthens the climate change focus of financial and regulatory frameworks, and lending policies
- Overcomes market barriers to low-carbon building and construction financing and create positive impacts beyond the scope of the activity.
- Creates incentives for low-carbon market transformation by reducing costs and risks, eliminating barriers to the deployment of low-carbon materials, technologies and climate-resilient buildings
- Catalyzes private-and public-sector investment in best practice low-carbon buildings, construction technologies and practices, and ongoing building operations and maintenance.

## » INTRODUCTION



Photo credit: Dominique Lalonde / flickr.com

The Paris Agreement on Climate Change (COP 21) initiates a global approach to climate action based on Nationally Determined Contributions. Parties to the Convention (Parties) nationally determine the actions that they are willing and able to take to contribute to limiting global warming to 1.5°C above pre-industrial levels by mid-century. These Nationally Determined Contributions (NDCs) describe a country's post 2020 national climate change mitigation and adaptation goals and targets. They describe overall targets and also specific sectoral actions being taken, or proposed to achieve them, and must be publicly registered with the United Nations Framework Convention on Climate Change (UNFCCC). To date 194 Parties to the convention have submitted NDCs, representing about 95% of all greenhouse gas (GHG) emissions. However, even full implementation of all current NDCs would still result in temperature increases of about 3.2°C by the end of this century, relative to pre-industrial levels (UNEP a, 2017). Current ambition across all sectors is therefore not sufficient to limit global warming to 2°C or 1.5°C.

The buildings sector contributes nearly 40% to global energy-related annual GHG emissions (IEA/UNEP, 2018). Final energy demand from buildings could increase 50% by 2050 compared with 2015 levels under business as usual scenarios due to rapid urbanisation and the doubling of the built surface area (+230 billion m<sup>2</sup> by 2060, UNEP 2016). Effective decarbonization of the

buildings sector is therefore critical to meeting the Paris Agreement Goals and exceeding the current level of ambition in NDCs.

*"Nationally Determined Contributions (NDCs) identify the post-2020 voluntary national climate targets, including mitigation and adaptation, which countries committed to which become binding when a country ratifies the Paris Agreement." (World Bank, 2018).*

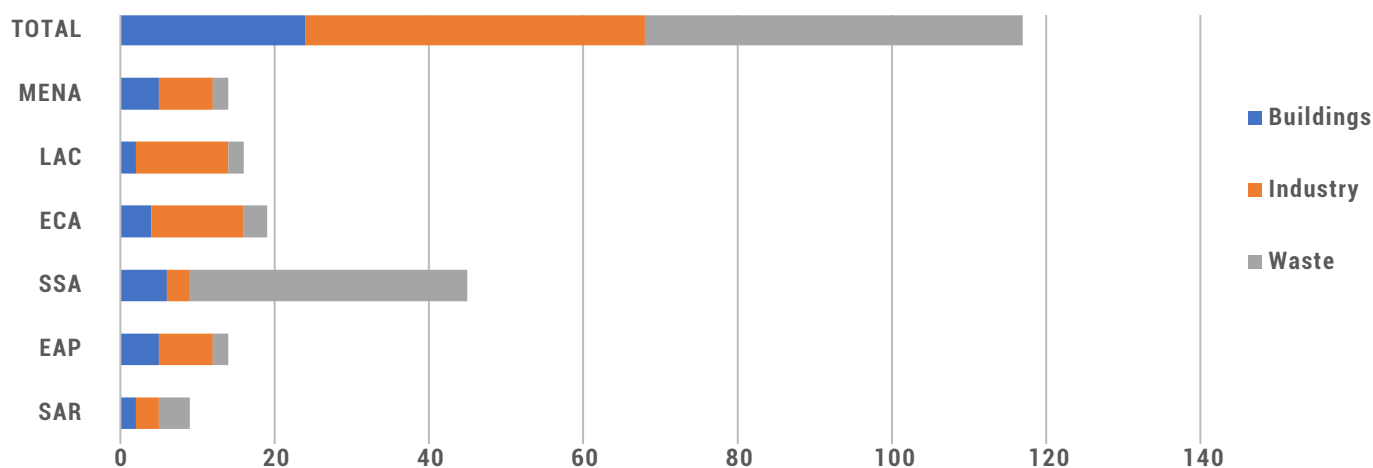
The buildings sector also offers the most cost-effective mitigation potential of any industrial sector (IPCC AR4, 2014) and a range of well documented co-benefits including job creation, improved indoor and outdoor air quality, improved climate resilience and adaptive capacity (IEA, 2014; IPCC AR5, 2014). Recognising this potential, one-hundred and thirty-six (136) parties have referenced action required by the buildings and/or construction sector in their NDCs. However, very few building sector actions included in NDCs specify mitigation targets, and if fully implemented, currently cover only about 60% of building related GHG emissions (IEA/UNEP, 2018). A more detailed analysis of buildings sector climate actions in NDCs is presented in the [GlobalABC Global Status Report 2018](#).



The buildings sector actions have also not been prioritised relative to other sectors included in NDCs to date. Even in the urban sub-sector, building sector actions are less prevalent than actions in industry and waste sectors in NDCs. (Figure 1)

What these analyses reveal is that while awareness of the need to engage with the building sector is high, more work is needed to increase the coverage and ambition of building sector climate actions. The current scope and ambition of buildings sector commitments are therefore, insufficient to meet the Paris Agreement goals.

Figure 1 Globally, buildings sector actions are less prevalent in NDCs than actions to reduce urban waste or industrial energy consumption.



Source: World Bank: <http://spappssecext.worldbank.org> accessed 02/11/2018)

Beyond NDCs, the Paris Agreement has catalysed thousands of non-party actors (such as municipalities and businesses) to register ambitious buildings-related climate commitments. This has renewed demand for policy expertise and technical assistance to engage the building sector in helping to achieve Nationally Determined Contributions and non-party climate commitments through the engagements of all levels of government, industry and civil society stakeholders. In particular, the strengthening of Technical Examination

Processes for Mitigation (TEP-M) and Adaptation (TEP-A) at COP21 and COP23 has provided further emphasis on ways of engaging stakeholders to identify scalable and replicable best practices, policies and technologies. In 2020 the focus of the TEP-M will be on human settlements, with an emphasis on low-emissions housing and building solutions (UNFCCC, 2018). **The emphasis on the buildings sector in 2020 provides an important opportunity** to recognise new and ambitious building sector actions being incorporated into NDCs.

#### Key point

## THE CURRENT SCOPE AND AMBITION OF BUILDINGS SECTOR COMMITMENTS ARE THEREFORE, INSUFFICIENT TO MEET THE PARIS AGREEMENT GOALS.

### TIME LINE FOR NDC SUBMISSIONS

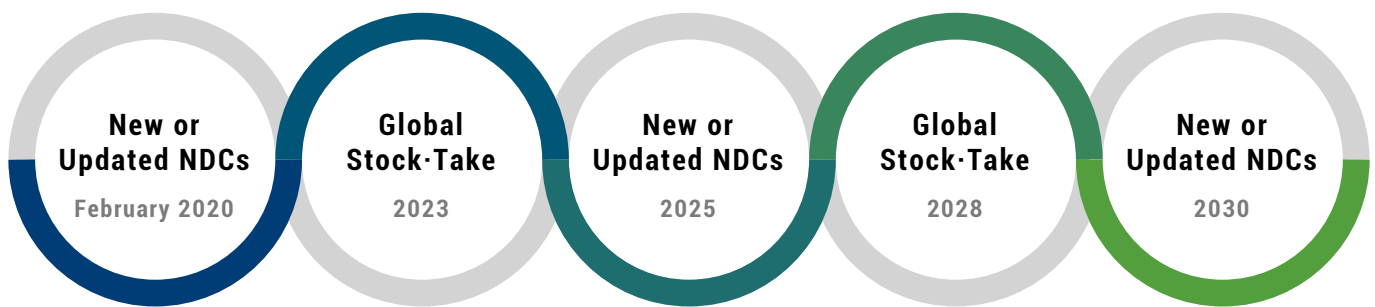
Under the Paris Agreement Parties are required to submit their NDCs by February 2020, and then subsequently update them on a preferred five-year cycle. Parties can update their NDCs at any time, and are required to do so nine to twelve months before the next key sessions of the Conference of the Parties serving as the meeting of the

Parties to the Paris Agreement (CMA) established by the Paris Agreement in 2020, 2025 and 2030. The UNFCCC will conduct global stock takes of collective progress every five years and make recommendations to inform the updating of NDCs. A global stocktake is scheduled for 2023 to inform the new 2025 NDCs and in 2028 to inform new 2030 NDCs.

**This guide is designed to address the urgent need for further extending the scope and ambition of building sector actions in NDCs**, the opportunities for aligning with commitments made by non-party actors, and the renewed support for successively increasing ambition and implementing actions of NDCs. It provides a simple process for incorporating or updating *ambitious* and

*effective* building sector actions in Nationally Determined Contributions. It focusses particularly on key actions that are necessary to address and overcome common challenges faced by countries in designing, financing and implementing ambitious and effective actions, and is intended to support the progressive updating of NDCs along the NDC cycle (Figure 1).

Figure 2 NDC Cycle as set out in the Paris Agreement



Source: ECBI, 2018

#### Key point

**THE EMPHASIS ON THE BUILDINGS SECTOR IN 2020 PROVIDES AN IMPORTANT OPPORTUNITY TO RECOGNISE NEW AND AMBITIOUS BUILDING SECTOR ACTIONS BEING INCORPORATED INTO NDCS.**

#### DEFINING AMBITION

Article 3 of the Paris Agreement calls for NDCs to be progressively ambitious, while Article 4 requires successive increases in ambition every five years. Many parties distinguish between a level of ambition that will be pursued unilaterally, and additional more ambitious levels achievable with international support.

In most cases buildings sector actions have initially been developed either to create or align with existing or planned actions to reduce the climate impact of the building sector. NDCs also often exist along-side sub-national government climate commitments, and commitments to action by the private sector and individual businesses (collectively known as non-party actor commitments). However, to contribute to the Paris Agreement goals, climate actions included in NDCs need to drive decarbonization of their buildings sectors, by establishing ambitious, achievable and fundable actions.

Many parties have already quantified the increased mitigation targets conditional on additional financial support from the international community. Indeed, successfully receiving funding through international finance institutions *requires* ambition in proposed programs and actions. Specific requirements for fundable projects or programs vary from agency to agency. However, large-scale bi-lateral and multi-lateral funding for climate actions share four key eligibility criteria which serve as a recipe for ambition in this guide. To be fundable actions need to:

- Have high mitigation and/or adaptation impact
- Be transformative & scalable (not a one-off project or program)
- Demonstrate a high level of stakeholder engagement and often commitment, with co-funding, leveraged private sector investment, and community in-kind support.
- Lead to measurable, reportable and verifiable outcomes.

Such ambition is urgently required from the buildings sector. Despite improvements in energy efficiency, the buildings sector overall is not decarbonizing (UNEP, 2017; IEA/UNEP, 2018). Increasing prosperity is driving demand for increased floor area and energy consumption, indicating little substantial changes in resource consumption behaviour. Overall building energy intensities have improved since 1990, but not enough to offset strong growth in building floor area. As a result, global building energy consumption continues to rise and become locked in for decades due to the longevity of building stock, while energy related GHG emissions remain constant at around 2016 levels (IEA/UNEP, 2018).

*Ambitious climate actions in the buildings sector can be defined as those which move the sector in countries towards zero-emissions by 2050, while increasing the resilience and adaptive capacity of the built environment.*

According to the GlobalABC Global Status Report 2017 (UNEP, 2017), building sector final energy demand must reduce by 30% by 2030 compared to 2015 (decreasing energy intensity by 2.5% per year in final kWh/m<sup>2</sup>) in order to be on track to limit global warming to below 2°C. With these goals in mind, ambitious climate actions in the buildings sector can be defined as those which move the sector in countries towards zero-emissions by 2050, while decreasing vulnerability and increasing the resilience and adaptive capacity of the built environment. As the GSR shows, there are still significant gaps in the scope and coverage of building-related actions.

The regulatory coverage of GHG emissions in actions included in NDCs currently varies greatly across energy end-uses. The coverage of energy-related emissions from space heating and cooling are of particular concern. Many countries that are facing increased cooling energy demand still lack cooling performance standards, and have not included the development of such policies in their NDCs. Similarly, emissions associated with material manufacturing and construction are not sufficiently addressed in existing NDC actions (GlobalABC, 2018). Building from existing policies and commitments, countries can extend the ambition of building sector actions by:

- Increasing the scope of existing building energy regulations to include a greater proportion of building types, particularly housing, and to renovation projects;
- Increasing energy performance standards for building envelopes, heating, cooling and ventilation systems, and appliances;

There is also only minimal consideration given in current NDCs to integrated urban land-use planning. This offers significant decarbonisation opportunities such as enabling sustainable mobility choices, reducing urban heat-island effects, and providing scale for integration of distributed renewable energy supply. Further opportunities for building sector decarbonization are possible through implementation of the recommendations of the [GlobalABC Global Roadmap](#), namely:

- Use urban planning policies to enable reduced energy demand, increased renewable energy capacity and improved infrastructure resilience.
- Increase uptake of net-zero operating emissions for buildings.
- Increase the rate of building energy renovation and increase the level of energy efficiency in existing buildings.
- Reduce the operating energy and emissions through improved energy management tools and operational capacity building.
- Reduce the energy demand from systems, appliances, lighting and cooking.
- Reduce the environmental impact of materials and equipment in the buildings and construction value chain by taking a life-cycle approach.
- Reduce building risks related to climate change by adapting building design and improving resilience.
- Increase secure, affordable and sustainable energy and reduce the carbon footprint of energy demand in buildings.

Bridging these gaps offer significant environmental, health and economic opportunities. And yet, most NDCs do not include specific quantitative or qualitative goals or targets for building sector actions. Building commitment to, and achieving common mitigation and adaptation goals requires effective implementation.

**Key point**

## SUCCESSFULLY RECEIVING FUNDING THROUGH INTERNATIONAL FINANCE INSTITUTIONS REQUIRES AMBITION IN PROPOSED NDC PROGRAMS AND ACTIONS.

**BEING EFFECTIVE**

To succeed, all jurisdictions must implement appropriate sustainable buildings policies that address the most significant drivers of building-related GHG emissions, and that attract the necessary investment to support the transformation to low-carbon construction and real-estate markets. They must also overcome some common barriers to such transitions. This guide was informed by a detailed content analysis of all Intended Nationally Determined Contributions (INDC) and NDCs submitted to the UNFCCC, and a survey of six countries that have already included specific building-sector actions in their NDCs, and Argentina, who had detailed a comprehensive implementation process. This research identified the following key barriers and challenges to effective implementation and increasing ambition of buildings sector actions:

- Capability Building in developing bankable projects; accessing funding
- Capability Building - in developing & enforcing new regulations, and
- Creating Demand - Raising awareness & developing markets
- Coordination between agencies, jurisdictions and the private sector
- Access to new technology
- Accessing data & monitoring

Added to these barriers and challenges, are more specific issues for project investors including:

- Providing clear institutional frameworks, transparent bidding and awarding procedures, a robust rule of law and little political interference to encourage investment\.

To be effective building sector actions also need to address sectors' diversity, complexity and fragmentation. For example, the governance of building performance is often the responsibility of multiple jurisdictions from national to local government. Ministries with jurisdiction over the construction industry also often do not have jurisdiction over climate change policies, environment or health. Addressing these institutional challenges is not

only important for effectively mitigating building sector climate impacts, but also for lowering vulnerability, improving resilience and adaptive capacity. Implementing new policies and stimulating market transformations that drive decarbonization, and adaptation also requires building the commitment and capability of a complex value chain that is dominated by small to medium enterprises.

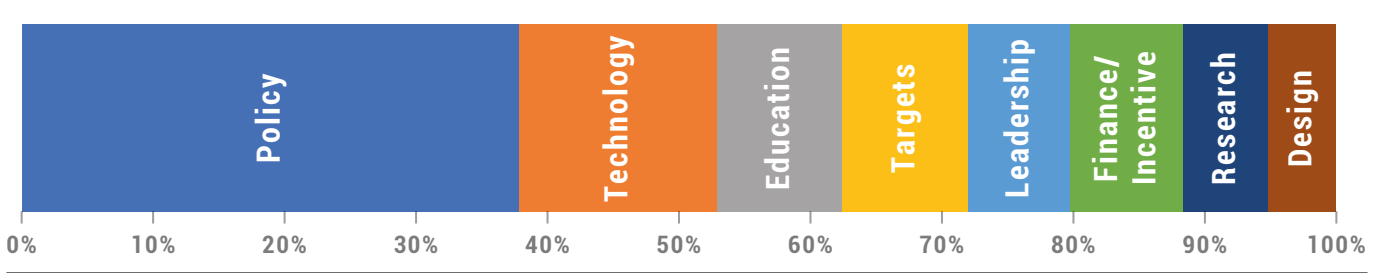
This guide helps identify policy actions that cover the main drivers of building sector emissions, and to establish institutional and stakeholder engagement that enables the implementation of buildings sector actions. Examples of approaches taken by countries that have incorporated building sector actions in their NDCs are included throughout.

**Types of Building Sector Actions included in current NDCs**

A closer analysis of the buildings sector actions that are described in NDCs reveals an emphasis on policy as a means of action (38%). Improving technology (15%), then education and awareness raising (10%) are the next most favoured approaches. A few NDCs mention government or industry led programs such as retrofitting of government buildings, or piloting of new green building standards (8%). Some NDCs intend to introduce new incentive and financing schemes, particularly for renewable energy such as solar P.V. and solar thermal (8%). Research, particularly collecting building energy performance data through audits, was also mentioned in some NDCs (7%), while encouraging design innovation as a mode of change was least prevalent (5%).

The most prevalent actions currently included in NDCs relate to the adoption of new building energy codes, labelling schemes and other building energy performance standards. Most actions focus on improving building energy efficiency, however a number of actions refer to green building standards which are normally more holistic and take into consideration broader life-cycle and resource consumption impacts and opportunities.

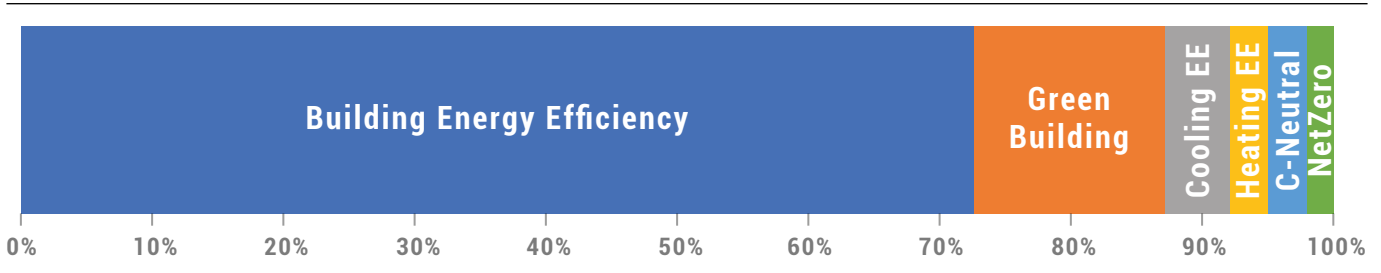
Figure 3 Types of Building Sector Actions mentioned in NDCs



The focus of these actions is overwhelmingly on improving building energy efficiency in general (73%). There also appears to be an emerging concern for more wholistic green building performance (15%). However, only a few NDCs are specific about the energy

performance attributes of buildings they are targeting; with cooling energy efficiency (5%) mentioned slightly more often than heating energy efficiency (3%), climate or carbon neutral buildings (3%), or net zero energy performance (2%).

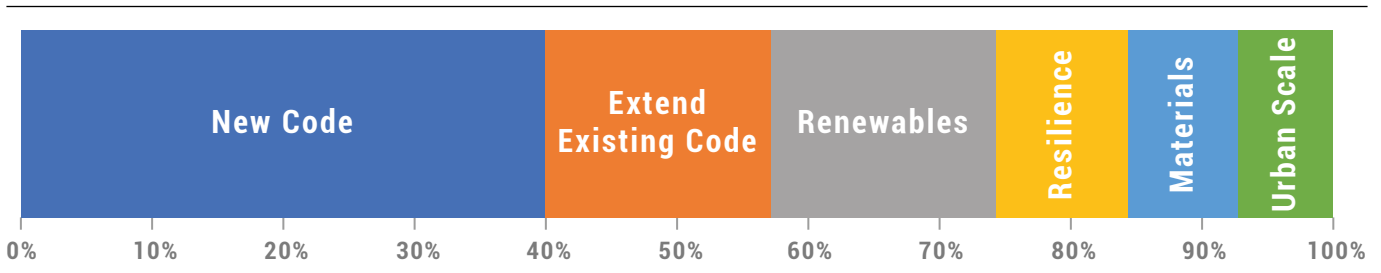
Figure 4 Performance Focus of Building Sector Actions mentioned in NDCs



Looking more closely at the policy actions that have been proposed, the emphasis is on developing new building energy codes (40%), then on extending existing codes to either increase minimum performance requirements and/or extend to residential construction (17%). Some NDCs also describe an intention to introducing policies

that encourage uptake of solar P.V. and solar hot water heating (17%). Increasing climate resilience (10%), reducing the impact of materials through resource conservation and encouraging uptake of green materials (9%), and linking to urban scale policies (7%) were also mentioned.

Figure 5 Policy Action Focus of Building Sector Actions mentioned in NDCs



The format and the need for brevity in description of actions in the format of NDCs mean that specific mention of buildings sector actions is commonly very high-level. Some NDC descriptions refer to aligned programs such as NAMAs, government or industry initiatives that indicate there are more detailed actions taking place, but most do not. While acknowledging these limitations, this brief typological analysis of current commitments

reveals a high level of awareness of the need to reduce operational energy demand of buildings, and of the effectiveness of building energy codes as a means of market transformation. This is consistent across developing and developed countries, with no discernible difference in types of actions mentioned.

However, there is room to improve the detail – especially in setting specific mitigation targets for building sector actions, linking with adaptation measures, and including an indication of how actions are to be implemented. In addition, very few actions describe an intention to move to carbon neutral or net-zero energy building performance, which is necessary for the sector to be on a below 2°C pathway. Nor do they commonly communicate the potential co-benefits of proposed actions.

It is evident that there is no consistent format being used to describe buildings sector actions in NDCs. This means that it is difficult to assess the scope, ambition and potential effectiveness of Parties commitments. **Developing a common format for describing and comparing buildings sector actions in NDCs is therefore necessary.**

### Key point

**THERE IS ROOM TO IMPROVE THE DETAIL OF BUILDING SECTOR ACTIONS IN NDCS ESPECIALLY IN SETTING SPECIFIC MITIGATION AND DECARBONISATION TARGETS FOR BUILDING SECTOR ACTIONS, LINKING WITH ADAPTATION MEASURES, AND INCLUDING AN INDICATION OF HOW ACTIONS ARE TO BE IMPLEMENTED.**

### Common Format for Describing Buildings Sector Actions in NDCs

Based on the preceding analysis, it is possible to derive a common format for a 'best-practice' approach to incorporating buildings sector actions into NDCs. The following common elements for describing building sector actions in NDCs are therefore suggested as a guide. A 'best-practice' description would:

#### **1 - Clearly communicate status of existing building sector climate actions, and additionality of new proposed actions based on:**

- A mapping of existing climate actions in the buildings sector
- An Measurable, Reportable & Verifiable (MRV) baseline scenario and gap analysis that sets the evidence base for prioritising mitigation actions required to limit global warming to well below 2°C.
- A target for net zero emissions from the building sector by 2050 with milestone of a 30% reduction in final energy demand by 2030 compared to 2015;

#### **2 – Prioritise Actions:**

- Codes: Commit to implementation of near or net zero energy performance new building codes and complimentary sustainable buildings policies for residential and non-residential construction and renovation
- Complimentary Sustainable Building Policies: Commit to extending the coverage of existing climate policy and codes to include all major building types, energy uses and life-cycle
- Technology: Commit to reducing the energy intensity of air-conditioners, heating, lighting, appliances, and the construction material supply chain & switching from solid and fossil fuel use to renewable electricity and increasing the energy performance of building envelopes.
- Education & Research: Ensuring all building practitioners are capable and responsible for decarbonising the buildings sector, and that building performance data is systematically collected and shared
- Incentives and financing: to develop and grow markets for low-carbon building
- Urban Scale: Integrated urban land-use and development control plans to capture mitigation and adaptation potential of sustainable urban systems
- Adaptation (Vulnerability & Resilience): Links to adaptation measures noted in the NDC and other national and sub-national initiatives.

**3 – List Implementation and monitoring actions, which at a minimum should include:**

- Identifying a lead agency to oversee the development, implementation and progressive updating of buildings sector actions
- Build administrative and technical capacity to fund, regulate, construct and operate low-carbon buildings
- Engagement of non-party actors, and key stakeholders in prioritising actions to achieve mitigation milestones and targets
- Description of leveraged activities such as NAMAs and required funding targets.
- Monitoring, evaluation and reporting performance of mitigation and adaptation actions in line with the Sustainable Development Goals, to inform global stock-taking, and the progressive updating of building sector actions every five years.

**STRUCTURE OF THE GUIDE**

The ‘Guide to Incorporating fundable buildings sector mitigation actions in NDCs’ is structured to assist you in adopting the best-practice approach described above. It is organised onto three sections:

**1 – Mapping**

This section explains how to determine the scope of actions and building industry sectors that should be included in order to achieve mitigation and adaptation goals.

**2 – Prioritising**

This section explains how to prioritise mitigation goals and actions based on general funding criteria used by multi-lateral donors and investors.

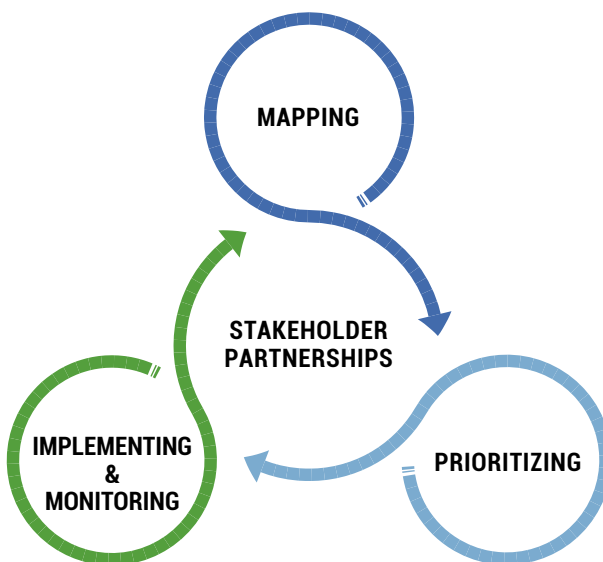
**3 – Implementing & Monitoring**

This section explains how to implement actions including governance, accessing finance, capacity building, finding technical assistance, and monitoring implementation.



Photo credit: Bill Perry / shutterstock.com

Figure 6 This guide is structured around three stages for incorporating ambitious and effective buildings sector GHG mitigation actions into NDCs. Each stage is underpinned by inclusive partnership with stakeholders.



There are a number of guides and tools that provide general frameworks for planning and implementing NDCs. These guides focus mainly on *what to do* in order to establish implementable mitigation and adaptation actions in NDCs. This guide is designed with reference to the common steps laid out in existing general guides, and adds guidance on *how to* achieve ambitious and effective outcomes in the buildings sector. You can dive into the guide at any point depending on your own circumstances. It also links with the evidence base on building sector actions, tools and resources offered by GlobalABC member organisations.



Photo credit: Bill Perry / shutterstock.com

# 1. MAPPING

**Goal:** The goal of the mapping phase is to have developed a clearly communicated status of existing building sector climate actions, established MRV baseline scenario and gap analysis that sets the evidence base for prioritising mitigation actions required to limit global warming to well below 2°C.

**Theory of Change:** Due to the fragmentation and diversity of the building sector it is important that national goals are informed by, and adapted to local market conditions. The process of planning building sector climate actions for NDCs therefore requires a high degree of coordination between government agencies at national, regional and local levels in order to clarify roles and responsibilities, and streamline the implementation of enabling policies. There also needs to be effective engagement with local businesses and communities in the construction value chain in order to understand local market barriers and opportunities that can inform policy, and identify front-runners that can serve as champions for change.

## Approach:

- Establish Mitigation MRV Baselines
- Map Existing Policies & Capabilities
- Develop Local Market Action Plans

## MEASURABLE, REPORTABLE & VERIFIABLE (MRV) EMISSIONS BASE-LINES

Establishing an empirical basis for prioritising building sector climate actions is an essential pre-requisite for qualifying for climate funding and financing. Actions must be able to demonstrate that they deliver measurable, reportable and Verifiable (MRV) energy savings and emissions abatement. For mitigation actions this requires the calculation of the building sector's emissions base-line based on business as usual, and a net-zero emissions scenario for 2050. Tracking the market penetration of net zero and green buildings is also an important indicator of transition.

### Calculating Mitigation Base-Lines

There are three common ways of generating energy use and GHG emissions base lines for a stock of buildings (top-down, bottom-up and hybrid).

## TOP-DOWN

This approach is useful if you only have access to aggregated building energy use data such as national, regional or municipal statistics on residential and/or non-residential energy-use. This approach requires information on the total building stock, total energy use and shares of different building types in the total energy use of the building sector. This approach is mostly useful, when the assessment has to be done on a large scale (e.g. country) and there is a lack of detailed data on that level.

*Data Needs:* Building stock data (Gross Floor Area), building energy demand, occupancy, energy end-use data (fuel type and consumption), Emissions factors for fuels and electricity used, renovation rates, and new construction rates.

## BOTTOM-UP

This approach is useful if you have more detailed measured energy use data from a representative sample of buildings in your building stock. You will be able to build-up an MRV baseline by entering more detailed energy data from individual buildings in different categories of building types – such as single or multi-family residential, commercial, hospitals etc. This approach focuses on (one or several) individual buildings and requires information on floor area and, total energy consumption in kWh and fuel mix for each particular building. Bottom-up approach can be applied as well, if all required data can be found for representative case studies, typical buildings or assumed averages. It also allows for utilizing experts' judgments (e.g. regarding specific energy consumption values) in case measured data are impossible to obtain. The Bottom-up approach is very useful for a certain (limited) group of buildings and/or for a concrete mitigation project, but can be less useful for establishment of a national baseline or Business as Usual (BAU).

*Data Needs:* Measured energy use data from a sample of buildings of the same type, floor area, occupancy, fuels used and end-uses, fuel and electricity emissions factors.





## HYBRID APPROACH:

This approach requires information on total floor area and, most importantly, specific energy consumption in kWh/m<sup>2</sup>, which allows for calculating total energy use for different end-uses, building types, climate zones, etc. at the level of a region, country or city. The Hybrid approach can be used on a smaller scale, when it is important to analyse different influences on energy use and GHG emissions (e.g. in different building types or climate zones), or in cases where there is a lack of data and need for detailed assessment on larger scales (country, region, etc.).

### NDC Commitments to Improve Data

*Guyana plans to conduct energy audits of its building stock, while Djibouti plans to conduct energy audits of its administrative buildings.*

*Jordan has committed to improving data collection on energy-use patterns and to identify the best data for energy efficiency policy and markets. It intends to carry out energy audits of public buildings and provide funding to allow schools, hospitals and other facilities to assess their energy savings potential.*

*Senegal plans to pass regulation requiring companies to conduct energy audits and energy supply studies to support improving their energy performance from 5-15%.*

A number of parties have included data-collection or capacity building for energy performance auditing of buildings in their NDCs. This data will enable their MRV methodologies.

### Further Resources from GlobalABC Members:

- Building Energy Performance Metrics [www.ipeec.org](http://www.ipeec.org)
- Common Carbon Metric (top down) [www.ccmbuildings.net](http://www.ccmbuildings.net)
- IFC EDGE Tool (bottom up) [www.edgebuildings.com](http://www.edgebuildings.com)
- Medpro-medee (projection of energy demand) <https://www.enerdata.net/solutions/medpro-medee-model.html>
- Odysée-MureTool <http://www.indicators.odyssee-mure.eu>
- TRACE Tool (hybrid) [www.esmap.org](http://www.esmap.org)

### Mapping Existing Policies, Commitments & Capabilities

It is important to integrate NDC actions with building sector actions included in other national climate plans and NAMAs. A mapping of existing policy coverage, existing climate plans, commitments and actions, including those of non-party actors, and governance capabilities and deficiencies can be conducted. The mitigation potential of existing policies and commitments should be estimated so that the existing level of policy coverage and ambition can be quantified.

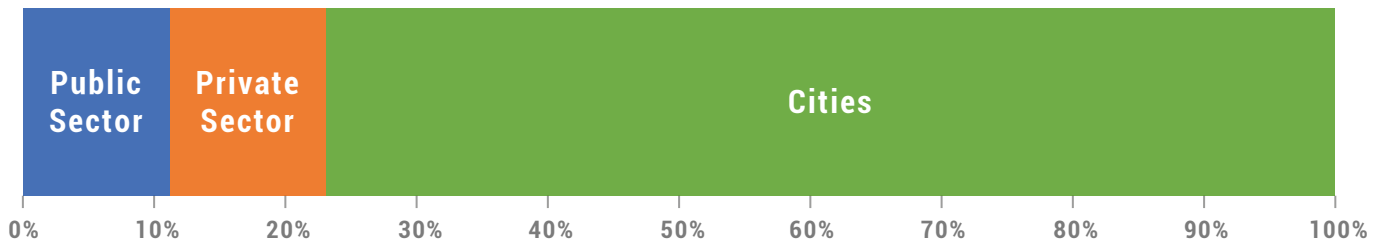
Comparing the base-line emissions and risks and the mitigation and adaptation potential of existing and committed policies, with the path to net zero-emissions by 2050 provides an estimate of the 'ambition gap'. This forms the basis for an effective evidence-based dialogue between government agencies and industry stakeholders to agree on common climate action mitigation and adaptation targets and appropriate governance for achieving them.

The public policy working area of the GlobalABC offers a framework for discussion about policy at national, and local level.

### Non-Party stakeholders Commitments

The majority of climate commitments involving actions in the buildings sector have been made by non-party stakeholders, particularly municipalities (Figure 7). In addition, a large number of municipalities and regional governments have committed to becoming carbon neutral by 2050. This level of commitment and momentum is a significant resource for national governments in planning, prioritising and implementing buildings sector climate actions in their NDCs.

Figure 7 Proportion of Building Sector Climate Commitments – NDCs and Non-Party Stakeholder Commitments



Source: UNFCCC; NAZCA Database

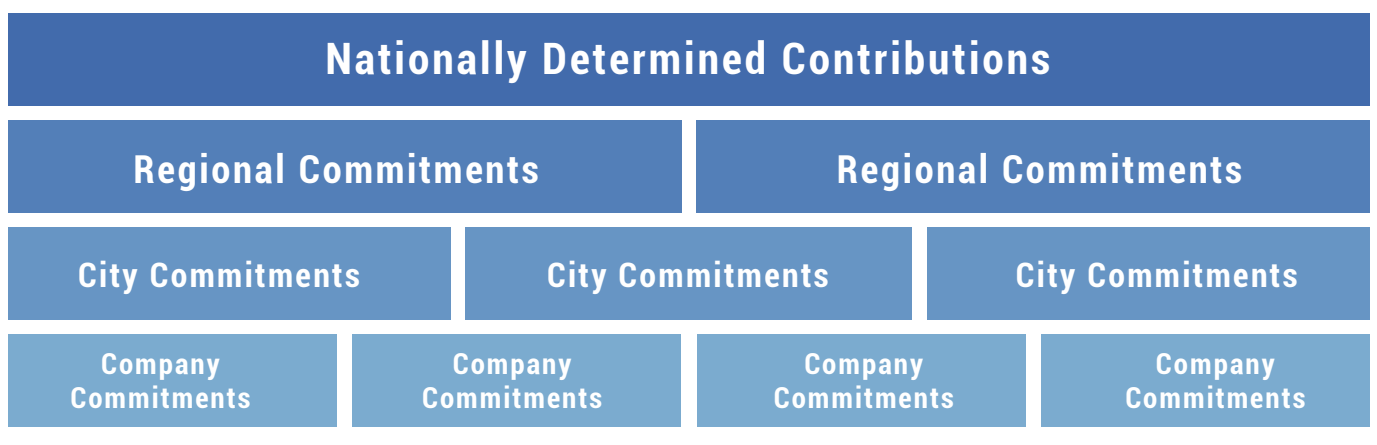
The private sector is also committing to ambitious goals for mainstreaming net-zero carbon and energy buildings. Notable among GlobalABC members are the World Green Building Council’s (WorldGBC) Advancing Net-Zero<sup>1</sup> program which engages its network of national Green Building Councils (GBCs) in achieving 100% net zero carbon buildings by 2050. This was further strengthened at the recent Global Climate Action Summit (San Francisco, 12-14 September 2018) with the launch of the Net Zero Carbon Buildings Commitment. Another initiative with similar ambitions is Architecture 2030 which supports public and private sector actions to mainstream zero carbon building in new construction, existing buildings and in construction materials. More GlobalABC member commitments can be found on the GlobalABC web-site <https://www.globalabc.org>.

If aligned, NDCs, together with the more extensive non-party stakeholder commitments provide a clear framework for action to decarbonize the buildings sector (Figure 8).

**GlobalABC Member Resources**

- Global roadmap [www.globalabc.org](http://www.globalabc.org)
- Zero energy Building definitions and Policy Activity – an international review, [www.IPEEC.org](http://www.IPEEC.org)
- More details on nearly zero energy buildings campaign: <http://www.cleanenergyministerial.org>

Figure 8 Ecosystem of Building Sector Climate Commitments



<sup>1</sup> World Green Buildings Council “Net Zero Carbon” principles allow for some portion of on-site energy use to be balanced with off-site renewable sources or purchased carbon offsets.

## Develop Local Market Action Plans

The mitigation and adaptation data, together with overall mitigation and adaptation targets should be localised as local market base-line reports. Relevant non-party-actor climate commitments can also be identified, and intermediate and regional cities and towns should be included. It is important to note that stakeholders at the local level may not prioritise mitigation or adaptation goals but may be far more motivated by co-benefits such as growth in local employment, improved air-quality, or the creation of new markets for products and services. These data support engagement with local market stakeholders who can contribute to local market action plans that identify local market opportunities and barriers, capacity, policy and technology gaps that need to be addressed to achieve targets and commitments and close the ‘ambition gap’.

### NDC Targets

**China** has set a target of 50% of all new buildings constructed by 2020 are to be certified green buildings. This would increase the market share of green buildings in China from 5% today to 28% in 2020. The Chinese Green Building Standard focusses on energy conservation rather than CO<sub>2</sub> mitigation.

**Grenada** has established energy savings targets for new construction of 30% to be achieved by new energy efficiency codes. It has set a target of a 20% reduction in energy consumption of existing buildings through retrofitting, and has committed to reducing energy demand in hotels by 20% by 2030.

**Moldova** has committed to achieving a 20% reduction in building related GHG emissions by 2020 through the adoption of new building codes

Effective stakeholder engagement is critical, and commonly a pre-requisite eligibility criterion for receiving funding for climate actions. It is common for governments to consult most with the private-sector when determining building sector climate actions. This includes consultations with professional bodies such institutes of architects, engineers, and real-estate developers, and chambers of commerce representing small-to-medium enterprises. In some countries trades unions, environmentalists, academics and experts have been included in consultations.

It is important to try to apply a consistent and transparent approach to facilitation in order to build consensus around the need for change. Ways of including the informal construction sector where this is a significant proportion of building activity should also be considered. Involving independent third-party facilitators should therefore be considered. A number of GlobalABC members offer programs to develop local market action plans. These include the Sustainable Energy for All Building Efficiency Accelerator led by the World Resources Institute and the World Business Council for Sustainable Development Energy Efficient Building Amplify initiatives.



Photo credit: Tony Budden / inhabitat.com



Photo credit: Construction at Hudson Yards / commons.wikimedia.org

## 2. PRIORITISING

**Goal:** The purpose of prioritising is to identify key actions that work together to enable the buildings sector to decarbonise and contribute to the resilience and adaptive capacity of built environments.

Unfortunately, in an industry as diverse and fragmented as construction and real-estate, it is unlikely that all stakeholders will agree on which actions to prioritise. The complexity of the sector and the number of stakeholders involved was identified as one of a number of barriers to increase the ambition of actions in NDCs. Countries also report that building energy efficiency and mitigation actions are still a low priority when compared to other sectors. Raising awareness of the benefits of buildings as productive assets, and buildings sector decarbonisation remain key challenges.

**Theory of Change:** Increasing access to programmatic funding and finance for building energy efficiency, capacity building, emissions mitigation and adaptation actions is the primary means of support requested by countries. Therefore, while respecting that there will be many local, regional and national variations in context that will influence which actions are prioritised, how fundable a course of action is, can be adopted as a common criterion.

### **Approach:**

Prioritise actions that:

- Have high mitigation and/or adaptation impact
- Are transformative & scalable (not a one-off project or program)
- Demonstrate a high level of stakeholder engagement and often commitment, with co-funding, leveraged private sector investment, and community in-kind support.
- Lead to measurable, reportable and verifiable outcomes (covered in Section 3).

The following sections describe how these conditions can be met.



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### **HIGH IMPACT MITIGATION CRITERIA**

High impact mitigation actions are those that deliver significant emissions reductions over time in line with the Paris Agreement's below 2°C warming goal. The design, orientation and urban density of buildings has an influence on urban sustainability and transport choices. Indicators of high impact actions in the buildings sector might include:

- The overall tonnes of CO<sub>2</sub> equivalent (tCO<sub>2</sub>eq) reduced or avoided (over the short, medium and long term annually and cumulatively);
- The degree to which lock-in of high emissions infrastructure is avoided;
- The extent to which barriers to scaling up are removed (potential to scale);
- The overall decrease in the energy and carbon intensity of buildings.

Another important consideration for funders is the additionality of proposed actions. This means that actions proposed should do more than just replicate existing programs or measures. For example, the GSR 2018 shows that there is a significant overlap between existing building energy policy coverage and NDC actions proposed to improve building envelope performance. This does not lead to a significant enough reduction in business as usual energy demand. To be fundable, actions need to be transformative rather than incremental, which means they need to lead to permanent shifts toward mainstreaming low-carbon buildings.

Through a rigorous systematic review of policy and technology impact research, The IPCC 5<sup>th</sup> Assessment Report identified the following categories of action with highest GHG mitigation potentials:

STRATEGY	MITIGATION POTENTIALS
Building Energy Efficiency Codes	30% - 70%
Policy Targets: Low-zero & positive energy buildings	<79%
Integrated Planning & Design, district heating-cooling	<30%
Building Design: Bio-Climatic, Bio-Positive, Adaptive, Resilience & integrated solar thermal & P.V.	30-50%
High-Efficiency envelope, heating & cooling technologies	<50%
Life-cycle Approach to greening the Value-Chain, labeling & MEPS	<40%
Behavior Change	<40%

## TRANSFORMATIVE & SCALABLE

According to the 2018 [Global Status Report](#), only about 50% of available CO<sub>2</sub> emissions mitigation potential is being addressed by existing policies and new commitments.

Achieving the remaining 50% requires three high-impact policy actions:

- Introducing new building energy codes with progressive increases in stringency scheduled to achieve mandatory net zero emissions building performance by 2050.
- Designing and implementing complimentary policy packages such as energy rating and labelling, that provide recognition and incentives to drive markets in high-performance, low-carbon buildings.
- Provide education and training for government agencies to stream-line policy implementations and improve enforcement and compliance.

### Building Energy Codes and Complimentary Policies

Among all policy actions, the most widely recognised and scalable action that can be taken to reduce energy-related GHG emissions from the buildings sector is the implementation of building energy codes. Having such codes in place and enforced effectively lifts the minimum performance of all buildings to which they apply. Building energy codes more commonly apply to new construction, and in fewer jurisdictions to major

building renovations. There are also fewer jurisdiction which enforce mandatory energy codes in residential construction.

A significant opportunity for high-impact policy actions therefore exists in extending the coverage of energy codes to building renovations, and to residential buildings. Incorporating codes into a package of complimentary policies that encourage builders to achieve better than minimum performance such as financial incentives, energy labelling, and capacity building significantly improves the energy and emissions saving potential of codes.



Photo credit: CC0 / topsimages.com

The other key element of a high-impact policy action is to establish an ambitious absolute emissions reduction target such as mandatory net-zero energy performance by 2050, with progressive performance milestones at 2030 and 2040 that the industry can be supported to achieve. Few countries have set such targets for buildings sector actions in their NDCs. Transforming to a sustainable buildings sector therefore requires actions at scale beyond the building site. The [GlobalABC Global Roadmap](#) recommends policy actions that:

- Use urban planning policies to enable reduced energy demand, increased renewable energy capacity and improved infrastructure resilience.
- Increase uptake of net-zero operating emissions for buildings.
- Increase the rate of building energy renovation and increase the level of energy efficiency in existing buildings.
- Reduce the operating energy and emissions through improved energy management tools and operational capacity building.
- Reduce the energy demand from systems, appliances, lighting and cooking.
- Reduce the environmental impact of materials and equipment in the buildings and construction value chain by taking a life-cycle approach.
- Reduce building risks related to climate change by adapting building design, lowering vulnerability and improving resilience.
- Increase secure, affordable and sustainable energy and reduce the carbon footprint of energy demand in buildings.

### **Additionality in NDCs**

*Mexico is expanding the spectrum of application of sustainable housing programs, first towards a retrofit, and second, expansion to sectors not directly served by government programs in further revisions to its NDC. Supporting this expansion are a number of NAMA programs that are focussed or effect its buildings sector, with a NAMA for sustainable housing in Mexico (Energy-Efficiency Measures in residential building sector) now being implemented. (GIZ, in-press 2018).*

*Seychelles is also planning to implement a new energy code for housing that includes roof insulation and passive design features including natural ventilation to support achieving an energy savings target of 50% from fans and air-conditioners by 2035. Their NDC also includes a mandate that all new buildings incorporate rainwater harvesting, solar P.V. and other sustainable building features.*

*Turkey has included the introduction of an energy performance certificate program for new and existing buildings to support reduction of energy consumption per square meter of floor area.*

*The United Arab Emirates are also planning the introduction of new green building regulations and energy standards applicable to building retrofitting.*



## Transformative Technologies

More than 50% of the mitigation potential of technology improvements remains on the table. Further actions to improve the energy efficiency of technologies that influence the use of energy in buildings such as space heating & cooling equipment, water heating and cooking are needed, as is further supporting energy conserving behaviour. This can be achieved through actions that:

- Improve the efficiency & construction quality of building envelopes
- Encourage the mainstream adoption of high-efficiency equipment and appliances
- Support energy conserving behaviour and social practices with smart controls and connected devices.

The performance of building envelopes, and the efficiency of cooling equipment in particular, significantly influence energy demand and associated emissions from buildings. Building energy demand and associated emissions can be reduced substantially through climatically appropriate design of low carbon, high durability building envelope systems (that avoid high embodied carbon materials and components such as petroleum-based insulation). Better windows and insulation, coupled with thermally isolated construction systems, and good orientation dramatically help to maintain comfortable indoor temperatures and daylighting, while reducing the need for added energy for heating, cooling, ventilation and lighting. Commercial building envelopes can be highly standardised, which improves the scalability of energy savings from technical improvements.

There is far greater diversity in residential sectors, so increasing energy performance standards for building envelope components such as windows, doors and thermal insulation is key. Complimentary actions include developing the design and construction competency to build with the requisite quality for high-performance buildings, and transitioning to low-carbon markets through implementing low-efficiency technology buy-back schemes, coupled with stimulating demand for high-efficiency domestic appliances.

### NDC Commitments on Transformative Technologies

*Mongolia is including Insulation improvements of old apartment buildings, efficiency improvement of heating systems and installation of heat meters in their NDC. They have included a series of targets to help monitor progress including: Reducing heat loss by 20% by 2020 and by 40% by 2030, compared to 2014 levels. To achieve this their NDC ambition is to have retrofitted 18,184 households in existing apartment buildings in the capital Ulaanbaatar.*

*Japan intends to introduce more high efficiency lighting, refrigerant control technology and high-efficiency air-conditioners.*

*Lesotho is planning a phase-out of incandescent light bulbs and introduction of motion-sensor lighting, introduction of new guidelines, standards and regulations for use of passive design and low-carbon materials in new construction, and implementing incentives for retrofitting existing buildings with more energy efficient appliances.*

### Highest Impact Behavioural and Managerial Actions

Even with the best intentions, high-efficiency buildings and equipment can be operated in ways that still waste energy. Supporting behaviour change by building occupants is often called for, but programs aimed at changing individual behaviour are often not effective. A more effective approach is to focus on the social practices of energy use – that is not just individual behaviour, but the social context that influences energy use. For example, educating people to increase thermostat settings and wear less clothes to stay cool at work can only be effective if there is a change in what is considered appropriate attire to wear to the office. Equally, at home people's energy use is affected by a range of factors related to the rituals of daily life – cooking, cleaning, washing, resting, entertaining and so on.



New smart-thermostat and environmental control technologies can help address such a variety of influencing factors by monitoring energy use and optimising the conservation of heating and cooling energy in response to occupant behaviours. The IEA suggest that widespread adoption of such smart systems could lower building energy consumption by up to 10% by 2040 (UNEP, 2017).

Real estate developers and private investors also need support to create business cases for sustainable building, and for implementing sustainable building construction and management practices. For example, the capital cost of energy efficient buildings is often over estimated by investors, while cost benefits are underestimated (EIU, 2013). The expectations of extremely high return on investment of the construction industry in most emerging countries is also a barrier for financing additionalities.

There are emerging opportunities for new business models such as ESCOs, energy services contracts and co-development that should be fostered. Managerial actions such as implementing ISO 50001 on Energy Management Systems, and “green leases” also have great potential impact in non-residential buildings. There are many actions being committed to at company level that set targets and plan energy efficiency improvement measures in privately owned buildings and facilities in many countries. These offer another level of potential alignment for increasing the ambition of measures included in NDCs.

Lack of awareness of the cost and co-benefits of energy efficient have been noted as a barrier to increasing market demand. To combat this a number of countries have also included education and awareness raising as elements of the buildings sector actions described in NDCs.

## HIGH LEVEL OF STAKEHOLDER ENGAGEMENT

Stakeholders are any person or entity that is likely to be affected by the actions being proposed. Engagement means involving them in understanding the problems, identifying opportunities, setting goals and prioritising actions. It also means developing long-term relationships to make it easier to implement and adjust actions over time.

In developing national actions, it is important to develop a consensus on common national mitigation and adaptation goals and priorities that align with non-party actor commitments, and that can be implemented locally. Stakeholder engagement is therefore essential to building this consensus and alignment within and between government agencies, civil society, and with the private sector. It is also often an eligibility requirement for climate program funding.

The buildings sector has a diverse value chain, with most activity dominated by small to medium enterprises (SMEs). There is also great heterogeneity in building types, designs, construction materials and techniques that respond to local market, cultural and environmental conditions. This needs to be considered when planning stakeholder engagement strategies.

The GlobalABC member, the Royal Institute of Chartered Surveyors (RICS) have developed ten best-practice principles for effective stakeholder engagement in the buildings sector (RICS, 2014). Consider these approaches, remembering that they will need to be adapted to suit different conditions.



**Principle 1 COMMUNICATE**

Ensure you ask what other's preferred mode of communication is. Have a diversity of approaches and media at your disposal.

**Principle 2 CONSULT EARLY AND OFTEN**

You may not be able to reach all stakeholders at the beginning of the planning process so be flexible. Plan engagement so that it is not one-off but ongoing.

**Principle 3 REMEMBER WE'RE ONLY HUMAN**

Try to understand different stakeholder's primary concerns and be open to subjective and emotional concerns as well as rational concerns.

**Principle 4 PLAN IT**

Ensure sufficient time is taken to plan and implement stakeholder engagement.

**Principle 5 REMEMBER RELATIONSHIPS ARE KEY**

Establish trust in the process and outcomes of engagement by taking time to solicit meaningful contributions from each participant, provide opportunities for review, and follow up regularly.

**Principle 6 SIMPLE, BUT NOT EASY**

Effective stakeholder engagement relies more on a series of characteristics of the facilitators rather than following a set of rules. There is therefore a need to balance the application of rigorous process and facilitation tools, with nuance and emotional intelligence.

**Principle 7 JUST PART OF MANAGING RISK**

Stakeholder engagement can also be thought of as a risk management tool. The risk of stakeholder *dis*-engagement might be especially pertinent when proposing ambitious changes in current building practices to achieve climate goals. Keeping high-risk stakeholders involved is key.

**Principle 8 COMPROMISE**

It is unlikely that all stakeholders will be able to agree on a course of action. However, given the importance limiting global warming to well below 2°C, compromising on the ambition to achieve net zero emissions is not an option. One technique is to ensure you understand whose priorities are really important to achieving this aim. You may be able to compromise on specific actions as long as the goal is agreed to.

**Principle 9 UNDERSTAND WHAT SUCCESS IS**

this could be usefully thought of as the aggregate value of the proposed actions to all stakeholders affected.

**Principle 10 TAKE RESPONSIBILITY**

Stakeholder engagement is predominantly a proactive activity which requires someone to take responsibility for its planning, implementation and follow up.

**Local Alliances**

The transition towards zero emission, energy efficient and resilient buildings is a long journey, requiring collective and concerted commitment by all buildings stakeholders in strong partnerships. The GlobalABC Public policy working group is therefore supporting national governments to gather and animate building stakeholders under local buildings and climate alliance such as:

- Alianza Global para los Edificios y la Construcción (Mexico, 2018)
- Alliance Marocaine du Batiment pour le Climat (Morocco, 2016)
- Plan Batiment Durable (France, 2009)

These local alliances aim to create a long term public private partnership with building professionals: Builders (contractors and trades), designers (architects, engineers), industry & retail (materials, equipment), property owners (private & public), services companies (ESCO, facility managers, developers, lawyers), and the finance sector (investors, banks). They are designed to have:

- Strong leadership: president of the organisation is a leader in the building sector, and independent from major economic interests
- Clear goals: is it about sustainability, quality, climate change (Paris agreement compliance and achieving NDC mitigation & adaptation goals)
- Light structure: action orientated rather than bureaucratic.
- Close relation with public authorities: To support implementation of regulatory recommendations
- Full Inclusiveness: Have representatives of stakeholders involved in governance, and strategic advisory roles
- Regular Communication: in professional press, periodic publications, policy recommendations, and organised events such as annual forums.

## NDC STAKEHOLDER ENGAGEMENT



Photo credit: CCO



### MEXICO

A large number of stakeholders representing the private sector, academia and civil society is engaged in an on-going series of networks and events to continually inform building energy and climate policy. These include conferences, as well as formal and informal knowledge exchange networks.

Photo credit: CCO / twitter.com



### MOROCCO

A broad consultation process with all relevant stakeholders was conducted during the preparation of the NDC. Institutional, national and international experts, and representatives of the private sector were consulted as part of this process. Ongoing engagement to develop the NDC implementation plan continues to be coordinated by the State Secretariat of Sustainable Development.

Photo credit: CCO / twitter.com



### SENEGAL

All relevant professions especially architects, the private and public real estate sectors and construction business were involved in determining the building sector actions included in Senegal's NDC.



Photo credit: eFesenko / shutterstock.com

## TUNISIA

*In the development of building sector actions, the responsible authority in Tunisia consulted with the country's Order of Engineers, Order of Architects, and National Union Chambers in the fields of Energy Efficiency and renewable energy.*



Photo credit: Mark-Agnor / shutterstock.com

## MONGOLIA

*Mongolia involved technical experts from their Building Energy Efficiency Centre, along with building energy experts, and professors from technical universities to identify the building sector actions included in its NDC, which were aimed predominantly at achieving large energy savings and CO2 mitigation goals.*

## 3. IMPLEMENTING & MONITORING

**Goal:** Develop an Implementation plan that is going to be effective in achieving building sector climate actions in NDCs and that meets the governance, financing and monitoring requirements of potential funders.

**Theory of Change:** A plan without a goal is but a plan; A goal without a plan is but a dream. Having identified the scope of existing building sector actions, and the prioritised high-impact actions that can bridge the ambition gap, a fundable process for implementation needs to be designed, communicated and monitored. It is critical that a decarbonization goal and milestones are established and that a lead agency is appointed to align responsibilities of agencies and jurisdictions in order to maintain progress and achieve the goal.

### **Approach:**

When developing fundable implementation plans for building sector climate actions

you should consider the extent to which the implementation process:

### *Governance:*

- Contributes to national and non-party actor priorities for low-emission buildings
- Builds from existing building climate policies and regulations to catalyze new policy and institutional changes
- Strengthens institutional and implementation capacity for decarbonizing the buildings sector
- Monitors, verifies and reports on the progress and impact of actions through open access knowledge sharing infrastructure.
- Plans for scaling up the scope and impact of the intended actions without equally increasing the total costs of implementation.

### *Finance:*

- Strengthens the climate change focus of financial and regulatory frameworks, and lending policies
- Overcomes market barriers to low-carbon building and construction financing and create positive impacts beyond the scope of the activity.

- Creates incentives for low-carbon market transformation by reducing costs and risks, eliminating barriers to the deployment of low-carbon materials, technologies and climate-resilient buildings
- Catalyzes private-and public-sector investment in best practice low-carbon buildings, construction technologies and practices, and ongoing building operations and maintenance.

### **KEY STRATEGIES FOR GOOD GOVERNANCE OF IMPLEMENTATION**

**Quantify the contribution of building sector actions to overall NDC climate mitigation and adaptation goals and establish corresponding building sector targets.**

Currently very few NDCs that mention specific building sector actions have set specific mitigation targets for those actions (IEA/UNEP, 2018). The quantification of the mitigation impacts is essential to the MRV process, as is setting clear goals that can be assigned to specific agencies to achieve. Impact assessment and the MRV approach are also essential for developing a fundable implementation plan.

**Establish a Lead Agency and an Inter-jurisdictional government agency consultation process**

One of the main challenges reported by governments to incorporating buildings sector actions into NDCs is the complexity of inter-agency relationships and often shared responsibilities for achieving climate goals within national strategies. Overcoming these complexities requires the alignment of building sector climate actions included in NDCs with actions included in other national mitigation frameworks such as Nationally Agreed Mitigation Actions (NAMAs) (if they exist). This helps to clarify which agency should lead implementation. Once a lead agency is assigned, an interagency consultation process, (facilitated in accordance with best-practice principles for stakeholder engagement) should be established to coordinate implementation, monitoring and reporting.

**NDC Appointing Lead Agencies:**

**Argentina:** Within the National Directorate of Climate Change (GNCC), a joint working group is developing the monitoring of mitigation measures and the generation of progress indicators. This is being developed within the framework of the GNCC. This work is implemented within sectoral action plans where barriers, possible instruments and financing needs are identified, as well as the form of monitoring required.

**Cameroon:** projects resulting from building sector actions were identified and initiated, with joint monitoring between the Ministry of Habitat and the Ministry of the Environment and Sustainable Development.

**Mexico:** Designed building sector climate actions within the framework of the NAMAs, including robust monitoring schemes that are in the process of being implemented through existing mechanisms in Mexico. A Special Climate Change Program (PECC), has been established to monitor government actions. Based on the MRV of the NAMA, in March 2017 the National Housing Commission (CONAVI) submitted the first national mitigation report on the housing sector to the National Institute of Ecology and Climate Change (INECC).

### **Provide education and training for government agencies to stream-line policy implementations and improve enforcement and compliance capabilities.**

The need for developing the capability of policy makers and government institutions to design and effectively enforce building climate policies has been consistently identified as priority in a number of recent global needs analysis surveys (Graham et al., 2017; Roshchanka et al, 2017). Governments also identified this lack of capability as a key challenge to further incorporating building sector actions into NDCs. This clearly needs to be addressed in implementation plans. Strengthening the institutional capacity to decarbonize the buildings sector is also an important goal for funding agencies.

A broad range of support is offered by GlobalABC members ranging from policy best-practice guidance, and training programs in Energy Efficiency policy-making, through to direct technical support through expert networks and 'deep-dive engagement' in specific locations.

**NDC Education & Training:**

**Senegal:** In support of its NDC Senegal is implementing awareness-raising and training programs for actions, energy consumption measures, development of new materials, incentives, regulations and support for promoters.

In their NDCs **Afghanistan** intends to increase access to information on technology, mitigation measures and financing for green buildings, while **Cameroon** intends to train and organise the entire construction value chain towards low consumption construction.

The **Ivory Coast** also intends to train all actors in the value chain in low-energy building. **Japan** has included education campaigns to increase the efficient use of lighting and extending its 'top-runner' appliance program (where energy efficiency targets are set based on the performance of the most efficient models on the market) in its NDC.

**Jordan, Yemen, Lesotho and Qatar** have also included conducting awareness raising and training campaigns to reduce energy demand in their NDCs. **Jordan** has also committed to developing an in-house show room at the Ministry of Energy and Mineral Resources to advise professionals on how to save energy.

**GlobalABC Member Resources**

Capacity building of designers, builders and trades in deep energy renovation: [www.renovation-doremi.com](http://www.renovation-doremi.com)

## Commit to regular progress reporting through National Climate Action Plans.

While acknowledging that access to building stock and energy use data remains challenging for many countries, monitoring impacts of actions and progress towards goals is an essential requirement for funders seeking to support NDC implementation. Countries such as Mexico and Morocco have established MRV frameworks through NAMA for Buildings programs, and as the example above from Argentina shows, it is practical to align monitoring and reporting with reporting against national action plans.

Countries surveyed for this guide are still challenged by the relatively low priority given to building sector climate actions, low level of demand for energy efficient buildings and low levels of awareness of benefits among industry and government stakeholders. It is therefore important to report on the co-benefits of building climate actions such as rates of new job creation, improved air-quality and public health, increased investment in sustainable buildings, and the development of new markets in energy efficient technologies. The IEA has published a guide to methodologies for calculating co-benefits.

### NDC Implementation Road-Maps:

*Morocco: As part of World Bank support for the implementation of Morocco's NDC, a modelling study was conducted, which assessed the different options available for policy reforms to most effectively achieve the NDC's energy efficiency objectives in the building sector. From this a roadmap for the implementation of the NDC which concerns all the sectors listed in the NDC, and in particular the building sector was created. An NDC Partnership Plan for the implementation of NDC is being now being developed. This tool will ensure harmonized programming and synergy of implementation and monitoring of results in relation to the objectives set. It will also guide the allocation of existing resources, identify additional resources to be mobilized and communicate to the NDC Partnership the specific needs in terms of service delivery, capacity building, financing, support and technical assistance.*

## GlobalABC Member Resources

- GlobalABC Global Status Reports: [www.globalabc.org](http://www.globalabc.org)
- GBPN – Energy Codes Implementation Portal: <http://www.gbpn.org/laboratory>
- IEA EE Training: [www.iea.org/training/](http://www.iea.org/training/)
- PEEB Programme for Energy Efficiency in Buildings: <https://www.peeb.build/home>
- SE for All Buildings Efficiency Accelerator: <http://buildingefficiencyaccelerator.org>
- UNEP-DTU Partnership – NDC & NAMA Implementation Guidance: [www.unepdtu.org/urc-tool-box](http://www.unepdtu.org/urc-tool-box)
- WBCSD Low Carbon Technology Partnerships: <https://lctpi.wbcsd.org>

## KEY STRATEGIES FOR FINANCING IMPLEMENTATION

Accessing finance for implementing building sector mitigation action is one of the most common barriers to further ambition noted by countries. However, international financial institutions (IFIs) also face challenges in meeting the needs and expectations of governments. For example:

- There are many different financing mechanisms and instruments for EE in buildings already developed; the challenge is to match the right instrument or various instruments combined with the intended EE financing concept.
- The intended investment needs to be prepared together with the IFI at the conceptual phase instead of submitting an already developed financing proposal to an IFI.
- Different financing lines need to be blended (e.g. some donor financing with combined GCF, GEF, Green Bonds etc.).
- The entire value chain of the investment for EE in buildings, the expected revenues at macro-economic level and all related co-benefits need to be assessed.
- There is a need for standardized project financing per building types and measures.

There are also a range of policy barriers to low-carbon transitions. Energy subsidies such as high electricity subsidies for households or other sub-sectors could be reformed to subsidise energy efficiency investments rather than energy consumption. Re-directing public budgets to support EE investments will thus, reducing future energy demand and reduce the overall cost of energy to households. However, to make such changes the following analysis is required.

### Calculate the costs and benefits of proposed actions

The perceived cost of implementing low-carbon building strategies is often higher than the actual cost (EIU, 2013). So, it is important to assess not only first costs, but also life-cycle costs and benefits of prioritized actions. A cost-benefit analysis should also consider the lock-in risks of high emissions building energy consumption, as well as the climate change risk posed to the buildings sector at global warming levels above 1.5°C.

### Identify investment gaps and market barriers to implementation

Once costs of building sector actions have been determined, establish the additional private sector support needed to bridge any investment gap between costs and available public-sector funding. A range of policy measures exist that can encourage private sector investment. The most fundamental however, is having a well implemented and ambitious building energy code and a well-organized policy package, offering incentives and recognition for going beyond minimum performance requirements.

### Institutionalize a long-term budget

The NDC cycle will run for decades. Building sector policy actions therefore need to be budgeted for over the long-term. Research shows that the potential return on investment to public budgets for establishing ambitious building energy policies is extremely positive in all global regions. For example, if a country were to commit of moving to net zero energy building energy codes as mandatory by 2020, the payback period in terms of energy costs to the national budget is around 10 years. The global average return on implementing policies that correspond to a below 2oC trajectory is +124% after 2030. According a recent study, focusing on low-hanging fruit or moderate energy efficiency policies never achieve

a positive return on investment (Urge-Vorsatz et al, 2015). Therefore, long-term commitment, and long-term planning for building climate actions is essential.

#### **NDC Long-Term Financing Strategies:**

*Afghanistan plans in to increase access to financing for green buildings, Bangladesh will incentivize rainwater harvesting in commercial buildings. Gambia and South Sudan are planning direct investment to energy efficient buildings.*

*Grenada plans to introduce tax incentives to promote the uptake of P.V. panels, solar hot water heaters, and installation of more efficient lighting. Suriname plans on removing tariffs on renewable energy related products.*

*Tunisia has established an Energy Transition Fund in 2014 for supporting its energy transition agenda and intends developing a carbon market mechanism to further support mitigation of emissions from the cement industry and energy efficiency and renewable energies in the buildings sector.*

### Develop a fund-raising strategy by creating a database of funding priorities of multi-lateral and bi-lateral donors

One of the key challenges facing parties as they develop their NDC actions is aligning with appropriate funding mechanisms for implementation. The NDC Partnership – a collaboration between GiZ, UNFCCC, the World Resources Institute and the COP22 in Marrakesh has created an on-line data-base to help match funding opportunities with NDC actions. <http://ndcpartnership.org/initiatives-navigator#open-funds-and-initiatives>.

There are also online guidelines available for planning NDC financing strategies such as the Climate Development Knowledge Network 'Quick Start Guide' to planning for NDC implementation. <https://www.cdkn.org/ndc-guide/book/planning-for-ndc-implementation-a-quick-start-guide/finance/>

### Market development through facilitating collaboration between banks, investors, clients and further stakeholders to open markets that enable NDC actions to be achieved.

Lack of demand for sustainable buildings is often cited as a barrier to mainstream market uptake. However, markets require more than just demand and supply to function well. Markets are dynamic, and require a catalyst and on-going support to transform, especially when introducing new ambitious performance requirements for buildings such as net-zero energy or carbon performance. According to Energiesprong (2017), creating a new market for net zero buildings requires:

- **Aggregating Demand:** working with large property portfolio owners and/or developers to provide the market with confidence of sufficiently high-volume production and creating a pipeline of projects that demonstrate a market opportunity for the industry to innovate.
- **Coordinating Stakeholders:** to jointly develop and improve the necessary market conditions including regulation and financing conditions. This requires a dialogue between local market actors to identify necessary reform to regulatory and planning frameworks, and introducing performance criteria for lending and accessing finance.
- **Mobilizing Collective Knowledge:** of the construction sector to innovate on new performance requirements through projects and supporting programs such as innovation incubators. Innovation may be a combination of technical, financial, or in business models – it is important to keep an open process so as not to pre-select only a few, or large companies. Innovation among SME' sis especially important in the buildings sector.
- **Provide Performance Guarantees:** New investments in energy efficiency are often considered high-risk due to the often relatively long pay-back periods, perception of higher up-front costs and disaggregated returns. Long-term performance guarantees are easier to implement if the performance requirement is net-zero energy rather than a relative improvement in energy efficiency.
- **Encourage third-party assessment and verification:** of energy-efficiency investment projects. Investors are often cautious about claims of the financial viability of energy efficiency projects made by project proponents. This can be overcome by developing clear energy efficiency project viability guidelines and trained independent project assessors, that can certify the quality of project proposals.
- **Demonstrate & Scale:** by monitoring, maintaining a community of practice around new innovative construction supply chains, sharing and promoting lessons learned and marketing the achieved benefits.

A number of parties have included government-led energy efficiency retrofitting programs, and procurement strategies that address some of these elements of market development and transformation. However, few have stated an intention to pursue net-zero performance. With the right strategy, this should be possible in further NDC revisions.

#### **NDC Market Development Actions**

*China plans to encourage public institutions to lead by example and advocate low carbon buildings, campuses, hospitals, stadiums and military buildings.*

*Djibouti plans to fund a program to reduce the energy consumption of public buildings, beginning with the retrofit of the Ministerial building and the installation of a roof top solar farm connected to the grid. This program is planned to later extend to all public buildings.*

*Japan includes provision for remodelling local government buildings for energy efficiency and conservation. Similarly, Jordan plans to make energy-related capital improvements in public facilities and Ministry buildings.*

#### **GlobalABC Member Resources**

- UNEP Finance Initiative Responsible Property Working Group [www.unepfi.org/investment/property/](http://www.unepfi.org/investment/property/)
- Real Estate Investment Framework: [www.unepfi.org/fileadmin/documents/SustainableRealEstateInvestment.pdf](http://www.unepfi.org/fileadmin/documents/SustainableRealEstateInvestment.pdf)
- Positive Impact Incubator: [www.unepfi.org/positive-impact/positive-impact/](http://www.unepfi.org/positive-impact/positive-impact/)
- Energie Sprong <http://energiesprong.eu>
- Investor Confidence Project [www.eepperformance.org](http://www.eepperformance.org)
- Transformative Action Program (TAP) <http://tap-potential.org/>





Photo credit: Patrick Bombaert / shutterstock.com

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# ARGENTINA



## HOW ACTIONS ARE CHOSEN FOR THE NDC:

In order to carry out the revision of the NDC, in 2016 through Decree 891, the National Cabinet of Climate Change (GNCC) was created, which is integrated by national ministries and secretariats, all organized in a consensual work in technical-political tables. Among its objectives, is the definition of climate change policies at the national level, as well as at the subnational level through joint work with COFEMA. In this framework, three Sectoral Action Plans on Climate Change for Energy, Forests and Transport have been developed. Argentina is currently developing the Production, Agro-Industry and Infrastructure Plans. (Infographics: <https://www.argentina.gob.ar/ambiente/sustentabilidad/planes-sectoriales>). In this sense, the actions of the construction sector were developed within the framework of the work tables of the NDC revision and later, in the development of the Sectoral Action Plans.



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## BUILDING SECTOR ACTIONS THAT WERE CONSIDERED BUT NOT INCLUDED

There are possibly further actions in the building sector that can be incorporated after the technical analysis of all interested parties (public and private sector).

## STAKEHOLDER ENGAGEMENT

After an analysis work, the mitigation measures were identified and developed in conjunction with the Energy and Production Authority. Each agency was responsible for carrying out the technical analysis in conjunction with the National Directorate of Climate Change, and with the participation of chambers and related associations.

## IMPLEMENTATION & MONITORING

Within the National Directorate of Climate Change, a joint work-group is being developed within the framework of the GNCC, by developing the monitoring of mitigation measures and the generation of progress indicators. This work is materialized within sectoral action plans where barriers, possible instruments and financing needs are identified, as well as the form of monitoring.

## BARRIERS TO IMPLEMENTATION

The barriers faced are diverse and are related to: difficulty of technological development, scarce financing, lack of training and dissemination, operational complexity for the implementation of some measures or need to update, modify or create legislation according to the new needs, among others.

## GREATEST CHALLENGES TO INCREASING AMBITION

One of the main challenges is based on promoting the growth and development of the national industry and continuing to deepen climate policies. Another objective is related to adaptation to reduce vulnerability and deal with the impacts of climate change.

## SUPPORT NEEDS

Cooperation could be financial, human resources and training, legal (regarding the support needed to have adequate legislation) or, for example, support in relation to fiscal incentives for the implementation of sectoral measures.

## FURTHER ACTIONS PLANNED TO CONTRIBUTE TO THE NDC

Within the Action Plan of the Energy sector, the measure of "thermal envelope" focuses on the reduction of energy consumption during use. On the other hand, within the Action Plan of the Industry sector, the measure of "industrialized construction systems" is based on the use of non-conventional materials to reduce the consumption of steel, water and energy in housing construction. This measure is associated with certain aspects that must be considered for gradual mitigation, such as the lack of trained personnel and the diffusion of alternative construction technologies.

# CAMEROON



## NDC COMMITMENTS:

- Revise building codes to improve energy performance by thermal standards of construction and renovation, and a certification process.
- Train and organize the entire value chain toward low consumption construction

## HOW BUILDING SECTOR ACTIONS ARE CHOSEN FOR THE NDC:

Introducing building energy codes and capacity building will improve resource conservation in the buildings & construction sector, and help address Cameroon's resource availability limitations.

## BUILDING SECTOR ACTIONS THAT WERE CONSIDERED BUT NOT INCLUDED.

A low level of awareness and industry capability in sustainable building in Cameroon contributed to limiting the scope of actions to the introduction of building energy codes.

## STAKEHOLDER ENGAGEMENT

Cameroon consulted relevant government agencies, the professional institutions of Architecture, Engineering, Urban Planning and Topographers in order to decide on the actions included in its NDC.

## IMPLEMENTATION & MONITORING

Responsibility for implementing and monitoring buildings sector actions is shared between the Ministry of Habitat, and the Ministry of the Environment & Sustainable Development.

## BARRIERS TO IMPLEMENTATION

Lack of financial resources, low awareness of actors.



Photo credit: Middle Africa / flickr.com

## GREATEST CHALLENGES TO INCREASING AMBITION

Making energy efficiency a national priority & reduce energy consumption in urban centres.

## SUPPORT NEEDS

Technical and financial support; capacity building of actors.

## FURTHER ACTIONS PLANNED TO CONTRIBUTE TO THE NDC

Further education and training program for actors in adopting new Cameroonian standards. Making standards mandatory and popularize their use.

# MEXICO



Photo credit: TheImadatter / wikipedia.org

*"Without implementation of effective energy efficiency measures, the IEA expects total residential and services buildings annual emissions to reach 124 MtCO<sub>2</sub>e by 2050, which would be almost 115 percent higher than buildings emissions levels in 2010 (exclusive of non-GHG emissions, such as local air pollutants and hazardous fumes, from traditional biomass use in residential cooking and heating) (IEA 2013)."- cited in PEEB, 2018*

## NDC COMMITMENTS:

Mexico includes the construction sector in its scope of energy-related mitigation actions.

- Encourages the construction of sustainable buildings and the transformation towards energy-efficient and low-carbon footprint sustainable cities;
- Promote residential use of solar panels and heaters;

It also considers adaptation measures by applying specifications for environmental protection and adaptation to the adverse effects of climate change in the planning, design, construction, operation and abandonment of tourism facilities in coastal ecosystems.

## HOW BUILDING SECTOR ACTIONS ARE CHOSEN FOR THE NDC:

Achieves large energy savings or CO<sub>2</sub> emissions mitigation goals.

## BUILDING SECTOR ACTIONS THAT WERE CONSIDERED BUT NOT INCLUDED.

Housing emissions are included in a set of residential and commercial actions. The contributions per program are not specified exactly. It is also necessary to include housing renovation actions that are being implemented. Actions being taken by the private sector are also not included in the NDC.

## STAKEHOLDER ENGAGEMENT

Architects, environmentalists, engineers, public policy makers were consulted.

## IMPLEMENTATION & MONITORING

Implementation is led and monitored through the Special Climate Change Program (PECC). Mexico has designed robust monitoring schemes within the framework of the NAMAs for Housing (New and Existing) that are in the process of being implemented through existing.

## BARRIERS TO IMPLEMENTATION

The lack of financing for expansion, lack of coordination among institutions, insufficient promotion of programs, lack of monitoring of actions in the buildings sector.

## GREATEST CHALLENGES TO INCREASING AMBITION

Expansion to all housing, especially those not subject to government subsidies and the ability to effectively monitor the entire residential and building sector. Also know the park of buildings in Mexico.

## SUPPORT NEEDS

Instruments of professionalisation of the housing sector, greater installed local capacities to permanently update the programs, development of sustainable housing certificate and deployment at the national level. Financing and a unified mechanism for measurement of emissions, and will of all parties for the measurement is needed.

## FURTHER ACTIONS PLANNED TO CONTRIBUTE TO THE NDC

Mexico are expanding the spectrum of application of sustainable housing programs, first towards a retrofit, and second, expansion to sectors not directly served by government programs. They also intend to generate new building codes as well as encourage subsidies gradually in buildings.

*\*\* For a detailed case study – refer to the Report: Integration of GHG emission mitigation actions of the building sector into the Nationally Determined Contributions (NDCs)" - 2018  
A study for the Programme for Energy Efficiency in Buildings (PEEB).*

# MONGOLIA

## NDC COMMITMENTS:

Reduce building heat loss by 20% by 2020 and by 40% by 2030, compared to 2014 levels.

Improved insulation for existing panel apartment buildings of 18,184 households in Ulaanbaatar.

## HOW BUILDING SECTOR ACTIONS ARE CHOSEN FOR THE NDC:

Achieves large energy savings or CO<sub>2</sub> emissions mitigation goals

## BUILDING SECTOR ACTIONS THAT WERE CONSIDERED BUT NOT INCLUDED.

No other actions were considered for the NDC.



Photo credit: Ayan Travel / tripadvisor.fr

## STAKEHOLDER ENGAGEMENT

Building energy efficiency centre, building energy experts, professors from the technical university were engaged in determining the building sector actions included in the NDC.

## IMPLEMENTATION & MONITORING

Mongolia is implementing actions using a project-based approach. They plan Insulation improvements of old apartment buildings; efficiency improvement of heating system; installation of heat meters.

## BARRIERS TO IMPLEMENTATION

Institutional barriers such as management and coordination between responsible ministries and agencies.

## GREATEST CHALLENGES TO INCREASING AMBITION

The logistics of projects requiring installation of insulation and heat meters for individual households located in apartments.

## SUPPORT NEEDS

Technical support to build capacity to analyse the actual cost of heat production and distribution from CHP and the development of a reasonable tariff structure.

## FURTHER ACTIONS PLANNED TO CONTRIBUTE TO THE NDC

Expand to the construction of green buildings.

# MOROCCO



*"The building sector in Morocco includes residential and tertiary buildings (Kingdom of Morocco, 2016a). The residential buildings are all buildings used for dwelling purposes such as traditional Moroccan houses, single houses (villas) and multi-apartment buildings. The tertiary buildings include hotels, buildings dedicated to education, hospitals, and administrative buildings. Buildings that house industrial facilities are not considered here, as they are included under the industrial sector. Total energy consumption of the building sector in Morocco was estimated at 14,951 KTEP in 2015 (SEED, 2018). Total direct GHG emissions were estimated at 8,471 Kt CO<sub>2</sub>e for the residential sub-sector and 605 kt CO<sub>2</sub>e for the commercial and institutional sub-sectors in 2012 according to the Biennial Update Report (Kingdom of Morocco, 2016b)." – PEEB, 2018*

## NDC COMMITMENTS:

Reduce energy consumption in buildings, industry, and transport by 12% by 2020 and 15% by 2030. *"The breakdown of expected energy savings per sector are: 48 % for industry, 23 % for transport, 19 % for residential buildings and 10 % for the tertiary sector"* – PEEB, 2018. Under the new 2030 Energy Efficiency Strategy, the energy savings objectives are 5 % by 2020 and 20% by 2030.

*"The building sector mitigation actions proposed under the NDC will reduce Morocco's GHG emissions by 38.4 Mt CO<sub>2</sub> by 2030. The mitigation effort of the residential and tertiary sector is 7.6% in 2020-2030 and 8.3% in 2030 (a cumulated reduction of 523.493 Mt CO<sub>2</sub>e is the NDC target for the period 2020-2030)".* – PEEB, 2018

## HOW BUILDING SECTOR ACTIONS ARE CHOSEN FOR THE NDC:

Achieves large energy savings or CO<sub>2</sub> emissions mitigation goals.

## BUILDING SECTOR ACTIONS THAT WERE CONSIDERED BUT NOT INCLUDED.

The NDC has been content with measurable actions in terms of GHG mitigation and energy saving. Several actions have not been included including: Actions related to the adaptation to Climate Change in the building sector; Use of low carbon building materials; The energy upgrade of existing buildings.

## STAKEHOLDER ENGAGEMENT

A broad consultation process with all relevant stakeholders during the preparation of the NDC was undertaken. Institutional, national and international experts, and representatives of the private sector were consulted as part of this process.

## IMPLEMENTATION & MONITORING

As part of World Bank support for the implementation of Morocco's NDC, a modelling study was conducted, which assessed the different options available for policy reforms to achieve optimally, the NDC's energy efficiency objectives in the building sector. A roadmap for the implementation of the NDC which concerns all the sectors listed in the NDC and in particular the building sector was developed; Under the NDC Partnership, a Partnership Plan for the implementation of NDC is being developed. This tool will ensure harmonized programming and synergy of implementation and monitoring of results in relation to the objectives set. It will also guide the allocation of existing resources, identify additional resources to be mobilized and communicate to the NDC Partnership the specific needs in terms of service delivery, capacity building, financing, support and technical assistance.





Photo credit: Foster + Partners / inhabitat.com

## BARRIERS TO IMPLEMENTATION

The multitude of stakeholders involved in the planning, implementation and implementation of energy efficiency projects in the building sector; The difficulty of setting up an MRV system to monitor energy efficiency projects in the building; The lack of financial mechanisms to finance the extra cost generated by energy efficiency measures in the building sector.

### Greatest Challenges to Increasing Ambition

Energy efficiency for building envelopes (providing financing, control and monitoring of the application of building thermal regulations).

### Support Needs

Accompanying the NDC actions, help developing an assembly of bankable projects to submit to climate finance and which will stimulate the market; Mobilization of financing for the setting up and implementation of large-scale energy efficiency programs in the building sector; The establishment of an MRV system to monitor the implementation of NDC projects.

## Further Actions Planned to Contribute to the NDC

Generalization of labelling and minimum energy performance for all household equipment; Energy upgrading of existing buildings; Environmental requirements for building materials; Revision of the thermal regulations to include the active aspect (equipment) and ventilation.

*\*\* For a detailed case study – refer to the Report: "Integrated approach for mitigation actions in the building sector for supporting the Nationally Determined Contributions (NDCs) implementation"- 2018*

*A Study for the Programme for Energy Efficiency in Buildings (PEEB).*

# SENEGAL



## NDC COMMITMENTS:

Pass regulation requiring companies to carry out energy audits and energy supply studies and to improve performance of building energy performance from 5% to 15%.

## HOW BUILDING SECTOR ACTIONS ARE CHOSEN FOR THE NDC:

The buildings sector actions included in the NDC were selected because:

- They align with actions being demonstrated in the building sector. The existing projects aim to reduce greenhouse gas emissions in the building and to the technology transfer project for the production of building materials based on Typha.
- They involve the private sector real estate sector and the public sector.
- They reduce building-related GHG emissions and generate employment.

## BUILDING SECTOR ACTIONS THAT WERE CONSIDERED BUT NOT INCLUDED.

No other actions were considered for the NDC.

## STAKEHOLDER ENGAGEMENT

Senegal consulted extensively with the private sector including all professions especially architects, the private and public real estate sector and businesses.

## IMPLEMENTATION & MONITORING

A number of measures are being used to facilitate awareness-raising and training actions, energy consumption measures, development of new materials, incentives, regulations and support for promoters.



Photo credit: CCO / gndr.org

## BARRIERS TO IMPLEMENTATION

Lack of incentives and financing for the implementation of actions in the building sector and the cost of implementation of the regulations.

## GREATEST CHALLENGES TO INCREASING AMBITION

The most difficult objectives to achieve are the mobilization of the market in the social sector due to the high costs of housing construction in general.

## SUPPORT NEEDS

Financing, training, and support for the implementation of the regulations.

## FURTHER ACTIONS PLANNED TO CONTRIBUTE TO THE NDC

Senegal is planning to include the development of bio-based materials and regulations and demonstrations in NDC updates.

# TUNISIA



## NDC COMMITMENTS:

Energy Efficiency contributing to overall target to decrease primary energy demand by 30% by 2030 compared to 2010, including renewable energy in the building sector, and the use of carbon market mechanisms to support building energy efficiency programmes.

## HOW BUILDING SECTOR ACTIONS ARE CHOSEN FOR THE NDC:

- Achieves large energy savings or CO2 emissions mitigation goals.
- NDC actions are forecast to generate 58000 jobs, 75% of which will be in the Building sector. Source: INDC Tunisia – accessed online: <https://www4.unfccc.int/sites/submissions/INDC/Submission%20Pages/submissions.aspx>

## BUILDING SECTOR ACTIONS THAT WERE CONSIDERED BUT NOT INCLUDED.

- None.

## STAKEHOLDER ENGAGEMENT

The Ministry of Equipment, Housing and Territorial Development, Technical Centers in the building field, The Tunisian Order of Engineers, Order of Architects and the National Union Chambers in the fields of Energy Efficiency and Renewable Energy.

## IMPLEMENTATION & MONITORING

Implementation action plans for Energy Efficiency and Renewable Energy programs, are approved by the Government. A monitoring Information system (EnerInfo) is being developed to monitor the implementation. Applies MRV systems developed in NAMAs.

## BARRIERS TO IMPLEMENTATION

Institutional, regulatory, financial, human capacity building barriers.

## GREATEST CHALLENGES TO INCREASING AMBITION

Objectives related to passive energy efficiency actions in the building sector.

## SUPPORT NEEDS

Technical Assistance, Capacity Building, Financing (Enhanced Lines of Credit, and access to funding)



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## FURTHER ACTIONS PLANNED TO CONTRIBUTE TO THE NDC

Tunisia plan to implement new actions in the building sector on the basis of results achieved and new opportunities identified. They plan to also extend actions to include:

- Energy Demand Reduction Objectives
- Increase in Building-Integrated Renewable Energy Supply
- Phase-out of Ineffective Building Components and Equipment
- Building Energy Rehabilitation Regulatory
- New “Green Building” Standards & New Building Energy Codes
- Education and Training Programs Training
- Investment and Financing Programs
- Renovation and Modernization Programs.



**Global Alliance  
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