



AFFORDABLE HOUSING: A ROUTE TO CLIMATE MITIGATION & RESILIENCE

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ACHIEVING NET ZERO AND BUILDING RESILIENCE THROUGH AFFORDABLE HOUSING

Green affordable housing is a vital opportunity to deliver climate mitigation and resilience through commercially viable, scalable solutions.

The built environment already contributes 39% of global greenhouse emissions, yet 70% of the buildings that will exist in Africa and Asia in 2050 are yet to be built. Cities are growing at an unprecedented rate, and by 2050 68% of the world population will be urban, with almost 90% of this increase being in Africa and Asia.¹ This represents an increase of 2.5 billion people from today, yet already at least 1.2 billion people worldwide currently live in substandard housing.²

New approaches that address both supply and demand side challenges must be utilised to ensure that affordable housing can be delivered at scale, alongside the required financial products for low-income households to meet their needs.³ At the same time investment must be channelled into housing that is both sustainable and affordable to secure global net zero emissions by 2050.

While we must urgently mitigate the greenhouse gas (GHG) emissions produced through construction, affordable housing also presents an opportunity to protect the homes, livelihoods and lives of those who are most vulnerable to climate change. Through well-built and inclusive designs, urban development can support the resilience of households, communities and cities that sit on the frontline of the climate crisis.

This policy brief demonstrates, through practical solutions for building mitigation and resilience, the double-win of meeting global commitments to net-zero alongside addressing a housing crisis which currently undermines the Sustainable Development 2030 Agenda and 2015 Paris Agreement global goals of leaving no-one behind.

SPOTLIGHT ON REALL

Reall pioneers climate-smart affordable housing solutions in urban Africa and Asia, demonstrating the commercial viability and social impact of delivering affordable housing for the bottom 40% of the income pyramid. Through proof-of-concept projects and investments, Reall leverages private sector resources to accelerate delivery at scale and transform low-income and affordable housing markets to support mitigation and resilience goals.

With over 30 years' experience in the sector, since 2000 Reall has invested over US\$80million into local developers, housing 106,000 people and creating 83,000 new jobs. These interventions have led to transformative impacts on the lives and opportunities of low-income occupants

Reall's in-country partnerships are driving down the carbon cost of construction with innovative, energy-efficient materials, technologies and designs. The result is climate-smart homes that are accessible and affordable for people on low incomes in these regions.



1 AUN Department of Economic and Social Affairs, 'World Urbanization Prospects' (2018): <https://population.un.org/wup/>

2 World Bank, 'Housing for All by 2030', (2016): <https://www.worldbank.org/en/news/infographic/2016/05/13/housing-for-all-by-2030>

3 World Economic Forum, 'Making affordable housing a reality in cities.' (2019) https://www3.weforum.org/docs/WEF_Making_Affordable_Housing_A_Reality_In_Cities_report.pdf

1 | KEY MESSAGES

1 PROVIDING AFFORDABLE, DECENT SHELTER FOR OVER 1 BILLION PEOPLE IS NOT A TRADE-OFF WITH THE GOALS OF THE PARIS AGREEMENT

There are enormous opportunities to advance sustainable solutions to the global housing deficit which support inclusive outcomes and climate-smart infrastructure, in line with climate and SDG agendas

2 INVESTING IN NET-ZERO AFFORDABLE HOUSING REPRESENTS A US\$17 TRILLION OPPORTUNITY

As well as delivering on the ambitions on Nationally Determined Contributions (NDCs) providing immeasurable gains for people, and the planet

3 COST IS NO BARRIER TO CLIMATE-SMART AND RESILIENT AFFORDABLE HOUSING

IFC are demonstrating that green affordable housing can be delivered at an additional cost of between 0 and 5%

4 ONLY CITIES THAT ARE PRO-POOR AND INCLUSIVE CAN TRULY BE RESILIENT

Investing to meet the basic needs of the most vulnerable reduces environmental footprints and strengthens urban systems and communities

5 SCALABLE SOLUTIONS ARE ALREADY AT HAND TO ACHIEVE NET ZERO AFFORDABLE HOUSING

Local innovation, originality and creativity are evident across the global south in design, materials and placemaking

2 | MITIGATION SOLUTIONS

Contributing 39% of global GHG emissions, the built environment is one of the most significant and challenging sectors to align with net-zero. However, affordable housing is an equally pressing need, with over 3 billion people estimated to be living in slum conditions by 2050.

Affordable housing markets must decarbonise construction methods and supply chains, in order to directly support city-scale mitigation strategies and inclusion goals.

Addressing Energy Needs

Cities disproportionately draw on global energy supplies and in turn significantly contribute to temperature rise. This creates a negative spiral as greater demand for cooling drives emissions and rapidly increases urban temperatures. This is predicted to be one of the major consumers of energy in future decades, with associated emissions from current cooling methods trebling by 2100⁴. Yet it is estimated that decarbonisation of the energy grid in Africa, combined with greater energy efficiency, could result in up to 60% reduction GHG emissions, against current forecasts.⁵ Housing construction has a huge role to play in this.

Affordable housing solutions can substantially reduce energy consumption with simple, low-cost passive design solutions through solar shading, cross-ventilation and reflective finishes. Scaled up, these designs can create spaces that minimise urban heat islands, and provide comfortable environments for occupants in the face of increasingly frequent and severe heatwaves.

Localised clean energy solutions such as solar panels directly reduce greenhouse emissions associated with heating, cooling and powering homes. When integrated with affordable homes, these build the resilience of home-dwellers against interrupted supply from the grid and unpredictable price fluctuations that may result from increasing energy demand of the climate crisis.

This policy brief demonstrates, through practical solutions for building mitigation and resilience, the double-win of meeting global commitments to net-zero alongside addressing a housing crisis which currently undermines the Sustainable Development 2030 Agenda and 2015 Paris Agreement global goals of leaving no-one behind.

AFFORDABLE GREEN ENERGY BILLIONBRICKS

INDIA PHILLIPINES

A for-profit social business, BillionBricks has developed a self-financing home that uses an integrated solar roofing system to provide off-grid energy to low-income households.

Conceived as the world's first carbon positive house, each home produces four times the amount of energy it requires. This additional energy can then be sold to power other communal facilities — generating income for the families who own them. The units additionally harvest 100% of all rainwater collected.



⁴ Cool Coalition 'Overview' (2019): <https://coolcoalition.org/>

⁵ Global Alliance for Buildings and Construction (GlobalABC), 'Regional Roadmap for Buildings and Construction in Africa' (2020): https://globalabc.org/sites/default/files/inline-files/GlobalABC_Roadmap_for_Buildings_and_Construction_in_Africa_FINAL2.pdf

Realising Sustainable Housing Delivery

The world's raw materials are being used at an unsustainable rate with demands for construction materials, such as sand and gravel, set to double by 2060. Cement alone is responsible for about 8% of global CO2 emissions (over 4 billion tonnes produced annually).⁶ As part of global efforts to avert the climate crisis, cities need to urgently shift from over-reliance on traditional buildings materials.

It is simply not possible nor sustainable to meet the current (let alone future) demand for adequate shelter and affordable housing through business-as-usual materials and design.⁷ Not only does demand for them create an unsustainable footprint on the world's natural resources, but building materials are major contributors to air pollution and greenhouse gas emissions.

Innovative material choices for a building can drive lower greenhouse emissions during construction and through its lifespan. Furthermore, materials sustainably drawn from renewable resources can simultaneously reduce costs, accelerate build programmes, and support local and sustainable job markets and supply chains.

Changes are needed, not only in the materials used, but also in the processes that supply them. By moving construction off site, developers can reduce construction waste management and limit pollution. Improvements in other areas of housing delivery, such as economising transport and running equipment more efficiently, can also work to reduce emissions.

Investing in developers that are pioneering and promoting these practices is essential to shift housing markets towards new, improved supply chains. In this way, green construction methods will become standardised and new private sector actors crowded in to further minimise the costs of delivering green, climate-smart housing, for increased affordability.

DESIGNING FOR A CIRCULAR ECONOMY BUILDX STUDIO KENYA

BuildX Studio is a design-build company that strives to achieve sustainability through local, sustainable material sourcing. In the four years since conception, BuildX have delivered an impressive number of projects, and in partnership with Reall, they are looking to deliver 10,000 green affordable homes by 2030.

This goal is realised through circular economy principles, whereby waste and emissions are minimised, and recycling and reuse are maximised. Using a mixture of bio-based materials and modular construction, BuildX is delivering high quality, low-emissions homes for as low as US\$14,500.

By moving the residential construction market away from dominant high carbon and wasteful construction methods, BuildX aims to provide a circular cooperative model that delivers truly affordable homes for a substantially greater segment of society. They prioritise livelihoods and job creation in their supply chains and their sister company BuildHer provides training and qualifications for women, boosting inclusion within the construction sector.



6 Lehne and Preston, 'Making Concrete Change: Innovation in Low-Carbon Cement and Concrete' Chatham House Report (2018): <https://www.chathamhouse.org/2018/06/making-concrete-change-innovation-low-carbon-cement-and-concrete>

7 OECD, 'Global Material Resources Outlook to 2060' (2019), <https://www.oecd.org/publications/global-material-resources-outlook-to-2060-9789264307452-en.htm>

Standardising Green Certification Systems

The belief that green certification is not possible for lower income housing in the global south is no longer valid.

EDGE (Excellence in Design for Greater Efficiencies) is an innovation of the International Finance Corporation (IFC) - a member of the World Bank Group. It is a certification system and tool which supports the delivery of greener buildings and helps housing developers to make better decisions earlier in the project process.⁸



The tool assesses a building's performance across energy efficiency, water efficiency and embodied energy in materials while identifying, in real-time, any incremental cost additions or savings as a result of green measures taken.⁹

Working with partners, Reall committed from 2020 to ensuring that 100% of its projects in affordable housing are EDGE-certified, demonstrating to the market that it is possible to deliver housing that is both climate-smart and affordable, and that is commercially viable at scale.

Delivery of green affordable housing under an internationally recognised and affordable standard such as EDGE is critical to create a common point of reference and confidence across all stakeholders. This will enable private investment to crowd into the sector faster while helping housing developers and governments to deliver with minimal additional overheads in certification or capacity building.

8 EDGE Buildings 'What Is Edge' (2021): <https://edgebuildings.com/about>

9 Reall 'Achieving the sustainable development goals through affordable housing in Africa and Asia' (2021): <https://www.reall.net/wp-content/uploads/2021/07/Achieving-the-Sustainable-Development-Goals-through-Affordable-Housing-in-Africa-and-Asia-1.pdf>

AUTONOMOUS, LOW-ENERGY HOMES MODULUSTECH PAKISTAN

ModulusTech is a developer that offers technical environmental solutions to the global housing crisis through their flat-packed prefabricated houses. The cost of their homes starts at just US\$8,000, allowing the business to prioritise the needs of those on low incomes.

Their panel design allows housing units to be erected in a matter of days, meaning that homes are delivered faster and with a fraction of the carbon output compared to conventional construction.



It is estimated that this technology saves 90% of carbon emissions per house over its lifetime, substantially surpassing the requirements of the EDGE certification. The technology is being used for single houses and double-storey new builds, but can also be used for refurbishment of existing structures. They operate off-grid with their own renewable energy and water purification systems.

Established in 2017, ModulusTech's designs and products have won various international awards and in 2019 they represented Pakistan at the G20 Global Solutions Summit. Now, in partnership with Reall, they are poised to take their homes to scale.

3 | BUILDING RESILIENCE

The number of people living in informal settlements is expected to more than double to 3 billion people by 2050 – the very same year that many countries aspire to meet their net-zero commitments. Many more live in substandard housing ill-equipped to deal with climate change and related disasters.

A warmer climate will intensify climate events and seasons, with implications for increased flooding and drought.¹⁰ This is already occurring globally, and accompanied by a sharp rise in the world's urban population, it means more and more people are moving to climate-vulnerable cities and regions.

Investment in climate-smart affordable housing is increasingly necessary to strengthen the long-term resilience of an increasing number of cities and their inhabitants.

Strengthening Resilience to Weather Events Caused by Climate Change

Informal and low-income homes are particularly at risk to climate-related disasters, as they are typically constructed from poor materials and situated in vulnerable areas. Their vulnerability and housing poverty undermine urban adaptation and resilience for all urban environments and citizens.

Cities can only demonstrate capacity for resilience when this is rooted in the successful provision of affordable housing to the least advantaged residents. By reducing property and livelihood loss, and displacement, quality affordable homes can support communities to cope in times of disruption.

If we are to substantially reduce the risk to occupiers in the event of climate-related hazards such as flooding, storms, heatwaves and wildfires, it is essential, at all levels of affordability, that housing is designed and built in appropriate, risk-assessed locations. When integrated into city-wide spatial planning processes affordable housing has a pivotal role to play in supporting density which is inclusive, that allows low income households to afford housing within easy access of jobs and services and reduces urban sprawl, and which protects the living conditions of millions of people.

HOUSING AS PROTECTION AGAINST CLIMATE-RELATED DISASTERS CASA REAL MOZAMBIQUE

Mozambique is particularly susceptible to climate change, with rapidly growing cities such as Beira (where c. 70% of the population live in informal housing) facing the twin challenges of increased vulnerability to intense weather conditions, and a lack of adequate affordable housing delivery.¹¹

Casa Real provides secure and affordable homes with land titles in integrated, safe communities. Houses are designed to be resilient by sourcing high quality local materials and using passive design strategies for natural ventilation as simple, effective, low-cost cyclone resistant techniques.

These housing designs are necessary for minimising human loss and reducing the risk of future structural damage. When Cyclone Idai hit Mozambique in 2019, 90% of buildings in Beira were destroyed, yet in comparison to the rest of the city Casa Real's homes suffered minimal damage and the structures withstood the impact.



EMPOWERING COMMUNITIES THROUGH CLIMATE-SMART HOUSING SMART HAVENS AFRICA UGANDA

Smart Havens is a social enterprise building climate-smart homes for people living on low incomes. In partnership with Reall they are looking to scale up to building 10,000 affordable homes per year from 2026.



Smart Havens undertakes innovative approaches by constructing their houses using compressed earth bricks. As well as being highly affordable, these are made using minimal cement with no firing. As brick production is a major source of CO2 emissions and pollution in Uganda, this product has the potential to provide a green, affordable alternative for housing solutions.

Underpinning their commitment to green building is an emphasis on social impact. Smart Havens' target market sits firmly within the bottom 40% of the income pyramid, but their focus lies beyond just on building houses towards building and empowering communities. In particular, they are dedicated to women's empowerment and prioritise female-headed households in the sale of their houses and provide much needed training in construction, property management and financial literacy for local women.¹² This provides greater opportunity and stability to families who would normally experience limited access to housing finance.

Supporting Nature-Based Solutions (NBS)

Meeting the global urban housing need must recognise the critical role that natural resources provide for urban adaptation and community resilience. Affordable housing, delivered with quality placemaking that fosters cohesive communities and environments, can contribute to the provision of local green spaces, reducing urban heat island effects and countering flooding risks.

NBS, such as interlocking compressed earth bricks and reed filtration water management systems, should be mainstreamed into planning for affordable housing and their environments. Doing so substantially reduces vulnerable communities' exposure to extreme urban temperature rises, lessens disasters resulting from flooding and sustains critical resources, such as water and urban gardens. These benefits also positively contribute to global goals in climate, biodiversity and sustainable development. Green infrastructure can be planned as an urban asset as much as the built environment in the form of 'green-grey' infrastructure solutions.¹³

Increasing Household Stability

Similarly, planned adequate green housing creates direct access to sustainable safe water and sanitation driving healthier communities. As temperatures rise there will be increasing pressure on urban water supplies and sanitation infrastructure. By building up community infrastructure and piloting new innovations such as Decentralised Wastewater Treatment Systems, it is possible to address sanitation through affordable housing in a climate-smart way.¹⁴ Where low income households live in planned developments, linked to off-grid water, sanitation and hygiene (WASH) solutions, their levels of vulnerability are significantly reduced.

10 IPCC 'Climate Change 2021 The Physical Science Basis, Summary for Policymakers' (2021): https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGL_SPM.pdf

11 11 Nkhonjera 'Affordable and Climate Resilient Building, A Case Study of Casa Real in Beira, Mozambique' Centre for Affordable Housing Africa (2020): https://housingfinanceafrica.org/app/uploads/Final-case-study_formatted.pdf

12 All-Party Parliamentary Group UN Global Goals 'Saving Resources: Actions that achieve both climate goals and the SDGs' (2021): <https://www.appg-globalgoals.org/news-events>

13 Reid 'How can Nature-Based Solutions Build Resilience of the Urban Poor?' URBANET (2020): <https://www.urbanet.info/how-can-nature-based-solutions-resilience-urban-poor/>

14 Reall 'Achieving the sustainable development goals through affordable housing in Africa and Asia' (2021): <https://www.reall.net/wp-content/uploads/2021/07/Achieving-the-Sustainable-Development-Goals-through-Affordable-Housing-in-Africa-and-Asia-1.pdf>

4 | SCALING SOLUTIONS

A green, affordable house is a fundamental investment solution to achieving net-zero and strengthening resilience of low-income households that are especially vulnerable to the effects of climate change.

Unlocking Green Finance

The investment opportunity for green buildings is estimated at US\$768 billion, most of which is in the residential sector.¹⁵ By unlocking the finance needed to support commercially viable affordable housing models, that are EDGE certified, investors can support the development of an emerging green asset class that channels funding into effective low-carbon solutions.

To support this, new financial instruments are needed. By issuing sustainability-linked bonds and green loans that can be linked to climate-specific targets, governments and financial institutions can apply the right incentives to create a new asset class.¹⁶ This will become integral to supporting the green transition needed for cities to reach net-zero by 2050 and will allow investors to participate in the green finance agenda.

Building a Case for Green Housing Finance

Green mortgage schemes allow households to purchase affordable homes, that integrate energy-saving materials and technologies, on a lower rate mortgage. A study in the US found that energy efficient homeowners are 32% less likely to default on their mortgage payments.¹⁷ These lower risks must be understood better in the context of Asia and Africa and where applicable taken into consideration when underwriting mortgages.

In turn this must occur in tandem with improved credit assessment tools that give a more informed view of credit worthiness. By utilising alternative data points, these can extend lending to households who work in the informal sector and lack formal credit histories. Additionally, such tools can streamline and shorten lending processes through real-time data and automated processing, with the cost savings can be passed on to the consumer.¹⁸ In this way access to affordable housing finance can be opened up to large segments of the population, allowing for offtake of climate-smart housing to reach scale.

Enabling Policy to Incentivise the Green Transition

Urban areas were identified as a priority area for climate adaptation under the Nationally determined contributions (NDCs) of the 2015 Paris Agreement, with a key focus on housing.¹⁹

Governments have a fundamental role in providing the support and amenable regulatory environments necessary to scale the delivery of affordable housing whilst meeting sustainability pledges and targets. Already the political will is building. Authorities in Ghana are outlining plans to re-engineer the city of Accra to better, accommodate the growing population, while conforming to global green city standards,²⁰ and Rwanda is mainstreaming low carbon development within national policy frameworks.²¹

Investors, governments and financial institutions must collaborate to unlock the capital needed, for an inclusive green transition that takes climate-smart affordable housing to scale.

¹⁵ IFC 'Green Buildings: A finance and policy Blueprint' Washington (2019)

https://www.ifc.org/wps/wcm/connect/topics_ext_content/ifc_external_corporate_site/climate+business/resources/green+buildings+report

¹⁶ Freidebur and Mora 'Averting Climate Catastrophe is a Huge Investment Opportunity' Nikkei Asia (2021):

<https://asia.nikkei.com/Opinion/Averting-climate-catastrophe-is-a-huge-investment-opportunity>

¹⁷ Institute of Market Transformation 'Home Energy Efficiency and Mortgage Risks' (2013): https://www.imt.org/wp-content/uploads/2018/02/IMT_UNC_HomeEE MortgageRisksfinal.pdf

¹⁸ Jones 'Digital credit scoring for affordable housing finance: Syntellect and Reall in urban India', Enterprise Development and Microfinance (2021): <https://practicalactionpublishing.com/article/>

¹⁹ UN Framework convention on Climate Change Nationally Determined Contributions Under the Paris Agreement, Synthesis Report by the Secretariat' (2021):

https://unfccc.int/sites/default/files/resource/cma2021_08_adv_1.pdf

²⁰ Cool Coalition, 'Accra Ghana to be made a Green City with Nature Based Solutions for Cooling' (2020): <https://coolcoalition.org/>

²¹ Price, 'Climate compatible development and rapid urbanisation in Rwanda' Institute of Development Studies (2019):

https://assets.publishing.service.gov.uk/media/5da5eb4fed915d17b5234463/660_Climate-Compatible_Development_and_Rapid_Urbanisation_in_Rwanda.pdf



REALL HAS BEEN BUILDING RELATIONSHIPS WITH KEY EMERGING MARKETS FOR OVER 30 YEARS

Reall has been building relationships with key emerging markets for over **30 years** and delivered life-changing opportunities for over 3 million people, created **200,000 jobs** and provided **465,000 people** with access to clean water and over **1 million people** with access to sanitation services.

Reall's work is driven through two delivery areas: '**Build**' – direct investments demonstrating the commercial viability of delivering to the bottom 40% income segment, and '**Broker**' – driving market transformation and addressing systemic barriers to housing sector growth. Coventry-based Reall has a history of delivering value for money with UK and Swedish taxpayer funds.

Reall's cornerstone investors have been the Swedish International Development Cooperation Agency (Sida) and the UK Government's Foreign, Commonwealth and Development Office (FCDO) who have supported **Reall** since 2004 and 2002 respectively.



Reall is a signatory to the UNFCCC's Race to Zero, pledging to become a net zero organisation. Addressing the climate crisis is at the heart of Reall's mission, and its commitment goes above and beyond the minimum pledge, **targeting net zero by 2030**.



Reall is a signatory to the UN Global Compact and has committed to implement universal sustainability principles on human rights, labour, environment and anti-corruption and take actions that advance societal goals.

WE SUPPORT



Reall is certifying its affordable housing through EDGE ("Excellence in Design for Greater Efficiencies") supporting the collective ambition to mainstream green buildings and help fight climate change.



For more information please contact the
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www.reall.net



A HOME
FOR
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