

DEVELOPING A BUILDINGS TAXONOMY ENTRY FOR SOUTH AFRICA

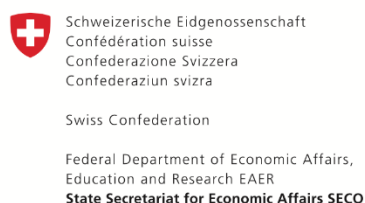
Why and how South Africa's ambitious Green Finance Taxonomy for Buildings is encouraging domestic Net Zero carbon market transformation

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BRIEFING PAPER



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About

A green finance taxonomy is an official classification or catalogue that defines a minimum set of assets, projects, and sectors that are eligible to be defined as "green" in line with best practice and national priorities. It can be used by investors, issuers, and other financial sector participants to track, monitor, and demonstrate the credentials of green activities.

The development of the 1st South African Green Finance Taxonomy was overseen by the Taxonomy Working Group, a multi-representative group drawing from national government, financial sector regulators, and the financial services sector and chaired by National Treasury. This initial phase of work for the Taxonomy Working Group is supported by IFC, part of the World Bank Group, through IFC's Green Bond Market Development program in partnership with SECO (Swiss State Secretariat for Economic Affairs) and Sida (Swedish International Development Cooperation Agency). It also benefits from global support from the IFC-facilitated Sustainable Banking Network (SBN).

National Business Initiative and the Carbon Trust were selected to carry out research, stakeholder consultation, and drafting on behalf of the Taxonomy Working Group for the first phase to (i) establish a governance structure and principles for the development and ongoing maintenance of a national sustainable finance taxonomy, and (ii) to develop an initial draft taxonomy for green and climate finance activities, leveraging existing international frameworks.

This briefing note provides background information to the development and use of the green buildings' definition of the taxonomy. It aims to highlight:

- Key challenges to the acceleration of the uptake of green buildings materials and practices in South Africa to date
- The rationale and approach for the development of green buildings' technical screening criteria, structured to support key stakeholders to address some key challenges, through the adoption of ambitious international best practice standards, adapted for the local context with considerations for market development
- Further additions and amendments that future taxonomy reviews may require to support the strengthening of the green buildings' ecosystem in South Africa, including by increasing the ambition of defined thresholds for these buildings

In engaging key stakeholders through the development of this briefing note and the green buildings' technical screening criteria, it was made apparent the keen interest of these stakeholders in further, ongoing engagements around development of the green buildings' enabling environment and market activity. Key stakeholders have highlighted the need for the convening of a technical development working group to support and accelerate the uptake of green buildings in South Africa, through addressing the diverse and inter-related key development challenges (many of which are identified in this briefing note). It is also envisioned that such a working group would support future enhancements and expansions to the green buildings technical screening criteria in the Green Finance Taxonomy, based on assessments of changes and improvements in the market, including elements of this definition that work, and those that do not, supporting any revisions to the taxonomy related to green buildings going forward.

It is further envisioned that financing decisions made concerning green buildings and declared as sustainable finance relative to the Green Finance Taxonomy technical screening criteria (as amended from time to time) would enjoy 'grandfathered' status, dependant on the timing and spirit of those transactions. This would mean that financing and transactions concluded for buildings and projects deemed to be 'green' under this first iteration whilst it is in effect, would still be considered to be green (to the extent appropriate) despite subsequent revised definitions.

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Introduction

The built environment currently produces around third of the world's carbon dioxide emissions, with buildings accounting for more than half of all electricity consumption – for heating, cooling, and lighting. In South Africa, buildings contribute to 15% of emissions. Building-related emissions per capita are above the G20 average (Climate Transparency, 2020). Cities are growing faster than ever to keep pace with population growth, rapid urbanisation, and income growth. South Africa's urban population growth is around 2% annually, with the percentage of the total population living in areas steadily increasing over the recent decades, rising from 55% in 2000 to 67% in 2020 (World Bank, 2020) and projected to continue.

At the same time, South Africa's emissions reduction targets are now more ambitious. The country's Low Emission Development Strategy puts forth an economy-wide low-carbon emissions target by 2050 (DFFE, 2020), while the current NDC sets out the country's ambition to reduce emissions to 350-420 Mt CO₂eq by 2030, deepening the cuts by around one-third compared with the 2015 pledge (RSA, 2021). Relating to this, several developments are pertinent:

- The draft Post-2015 National Energy Efficiency Strategy (NEES) targets a reduction in energy demand for public, residential, and commercial buildings by 2030 on a 2015 baseline of 50%, 20% and 37% per m² respectively (DoE, 2016).
- In December 2020, published under the National Energy Act 2008, SANS 1544 regulation requires building owners to display Energy Performance Certificates (EPCs) for certain occupancy classes of existing buildings. EPCs are mandated to be displayed in all existing buildings with occupancy class A1; A2; A3 and G1; private sector buildings larger than 2000 m² and public sector buildings larger than 1000 m². SANS 1544 references the National Building Regulations energy efficiency regulation SANS 10400-XA:2021, which regulates energy efficiency in new buildings.
- SANS 10400-XA, the mandatory building codes for new residential and non-residential buildings, have recently been revised and come into force (SABS, 2021). The revisions are laudable, although further upgrades and raised ambition will be needed to drive the much-needed sector transformation. There will be a need to strengthen the link with enforcement and compliance, including to demonstrate standards have been met once construction has been completed.

The accelerated adoption and uptake of green building practices and construction, especially with regards energy efficiency and energy sourcing practices, is essential to support South Africa meet its energy efficiency targets and build sector resilience.

There is a strong business case for accelerating the green buildings market, with growing evidence to suggest that green buildings are higher value, and lower risk: lower operating and maintenance costs over the longer term, lower rates of default, lowered risks of becoming a stranded asset and potential for higher returns on investment (IFC, 2019). Embedding energy efficient systems and low carbon materials into the design, maximising financial benefits from energy savings, and minimising the need for retrofits later.

In South Africa, several green building certifications have been established and with them, a well-developed understanding that a green building is one with consideration for a host of critical factors in energy and resource efficiency and environmental responsibility, across its lifecycle. Please see section below

regarding defining both net zero and 'greenness' for buildings on page 12. There is a growing general awareness of the definitions provided by these certifications. Consideration of these existing definitions and performance requirements are now incorporated into the 1st Edition of the South African Green Finance Taxonomy (SA GFT), published in April 2022.

However, there are several constraints that hamper the development of a much stronger bankable pipeline of projects and wide adoption of green construction and retrofits.

- Green buildings are often seen to be more expensive to design and build – including because of the materials and expertise required.
- Green buildings have insufficient incentives available to developers and investors. While credible studies supported by GBCSA and IFC have quantified a 'green premium' – i.e., a financial benefit to green buildings compared to not pursuing these measures – the impression remains pervasive in market stakeholders this project engaged with, including in domestic commercial banks.
- A lack of robust comprehensive data on current building portfolios, which could inform market and product developments.
- Some market participants also expressed the view that the lack of a widely agreed-upon definition of what constitutes a green building for the South Africa context, and one consistent and agreed-upon approach to attain and verify such status, was a source of confusion. The variety of certifications options may be positive for market choice and development, but it would appear that some actors desire at least orientation in terms of these options.

These challenges exist despite the varied efforts of commercial finance actors, an established and active green buildings council and related industry bodies, a developing policy and defined regulatory space, and the efforts of some developers and asset owners themselves. Increased coordination and innovation, effective regulatory intervention, and a mix of additional encouraging measures needed in combination.

A 'green building' is a multidimensional concept, not only concerned with climate change mitigation. Many of the accepted definitions and schemes in South Africa incorporate performance considerations for energy, water, biodiversity, waste, and others. There is an increasing focus on climate change-related risk and opportunity at present, particularly given government target setting related to net zero. In defining and referring to green buildings within this document and in the SA GFT, we consider green buildings to encompass fundamentally, net zero considerations for climate mitigation (further details are included on page 12).

Globally, investor groups and significant asset owners are making commitments to net zero carbon targets. The UN-convened Net Zero Asset Owner Alliance members are aiming to reduce emissions from their investments by as much as 65% by 2030, across portfolios that include significant investments in real estate. This group is only one of several investor groups that have formed to address risks to the global economy from climate change (Flood & Mundy, 2022). Corporates in South Africa are strategically aligning themselves to net zero emissions (Beck, 2021). Consequently, demand for green/net zero certified buildings based on their climate change mitigation performance will increase over time. This shift toward green buildings with strong climate change mitigation performance, will have a significant impact on the real estate sector across the different segments. The sector will need to adapt and transform to ensure demand

for green buildings is met with supply, and current building stock does not risk becoming vacant and ultimately a stranded asset.

The necessary pivot towards net zero carbon presents a host of practical challenges for businesses – gaining buy in from stakeholders, competing with other businesses priorities and data collection and reporting. Lack of availability of data on existing stock, lack of enforcement and until recently, limited scope of current standards.

Financial institutions have themselves pushed forward with initiatives, such as green loans for buildings and issuing green bonds for buildings, although these consider the board definition of ‘green’ and not only climate change mitigation. A common goal, and common, yet ambitious definition of what ‘green’ looks like (holistically for climate change mitigation, climate change adaptation and the other four environmental objectives covered by the SA GFT), with clarity from financial sector participants of *which* environmental objective(s) is contributed towards within such transactions, will increase confidence in the market that such buildings are what they are certified to be and that all taxonomy principles have been applied.

As set out in the Green Finance Taxonomy Development Briefing Papers¹, the scope of the 1st Edition SA GFT was delineated to begin with MSC Technical Screening Criteria (TSC) for two environmental objectives: climate change mitigation, and climate change adaptation. The MSC TSC for the other four environmental objectives² are no less important, but project development timing and constraints have required this prioritisation. Therefore:

- In this 1st Edition SA GFT, there is a predominance of climate change considerations – and in the Buildings Standard this means that we have focused on performance for these two environmental objectives. That does not suggest that ‘Green Buildings’ is wholly encompassed by performance in climate and carbon.
- The Buildings Standard MSC TSC development approach in the 1st Ed. SA GFT establishes a future MSC TSC design approach for the other four environmental objectives, in which these existing definitions are likely strongly to be incorporated.

For the present moment, however, we focus efforts, and the rest of this Briefing Paper considers climate change mitigation. Throughout this Briefing Paper, where ‘net zero’ is defined, this refers to climate change mitigation and the objective of ‘net zero carbon emissions’ (this is narrowed, from net zero performance in other environmental impact dimensions).

¹ Refer to the Briefing Paper: *Rationale for a phased approach to developing South Africa’s Sustainable Finance Taxonomy: Starting with a voluntary green tool focused on climate change, and expanding and deepening for coherent ecosystem development*, published alongside the 1st Edition SA GFT.

² The six environmental objectives of the 1st Edition SA GFT are: climate change mitigation; climate change adaptation; sustainable use of water and marine resources; Ecosystem protection and restoration; pollution prevention; sustainable resource use and circularity.

It is envisioned that a green taxonomy definition for buildings will allow for better communication between key actors in the market, drive more consistent and robust data collection, support financial institutions and set targets for their portfolios aligned to a common goal, and ultimately to drive decarbonisation ambition in the real estate market, as one of the core environmental objectives for South Africa. Much activity is already underway in this regard, through the efforts of the GBCSA, World Green Building Council (WGBC), World Economic Forum (WEF) and C40 Network, and the SA GFT does not supersede, but rather seeks to complement and reinforce this progress.

The essential benefit of the SA GFT beyond these existing definitions being:

- It aims to incorporate and reconcile existing definitions within the taxonomy design principles, which require simultaneously that the activity must Make Significant Contribution (MSC) to an environmental objective, whilst not triggering any Do No Significant Harm (DNSH) criteria and ensuring that requirements to of Minimum Social Safeguards are met.
- It attempts to standardise inter-scheme recognition and consolidate developments on several fronts.
- It leans on these existing definitions and identifies the metrics and thresholds, consolidated in the compendium of Technical Screening Criteria contained in the SA GFT aimed at South African financial sector participants, so that there is a single reference for these actors.

Ultimately, a definition of a net zero-aligned green building in South Africa is intended to support the market to deliver buildings in line with the aims of the Paris agreement and national decarbonisation plans– that is, achieving net zero carbon buildings for all new buildings by 2030 and for all existing buildings by 2050.

Market development challenges

Growth of the green buildings market in South Africa at pace required to meet decarbonisation targets is hampered by several key challenges and barriers, identified through direct interviews with key market actors and a literature review. The results are highlighted in the table below and detailed in the following sections, arranged into three main categories: (1) political, legal and regulatory barriers, (2) information, awareness and knowledge and (3) economic and financial.

Table 1 High-level summary of challenges and barriers to buildings sector decarbonisation in South Africa

Category	Challenges and barriers
Political, legal and regulatory	<ul style="list-style-type: none"> • Lack of enabling legislation and enforcement • Poor enforcement of sustainable building codes and regulations • Changes in green building codes and regulations
Information, awareness and knowledge	<ul style="list-style-type: none"> • Lack of public awareness and knowledge and information about green buildings • Limited market demand from limited awareness of the costs and benefits from owners and operators • Resistance to change from conventional buildings • Lack of common understanding and communication of interests among key stakeholders • Uncertainty over long-term performance • Energy savings and performance uncertainty • Lack of known sources, and comparable publicly available data on performance • Limited coherent targets for improvement
Economic and financial	<ul style="list-style-type: none"> • South Africa's poor economic climate and decreasing investor confidence • Lack of infrastructure development by national government • Perception of high initial costs amongst uninformed key stakeholders • Cost estimation inaccuracy and uncertainty • Perceived high cost of sustainable materials • Foreign exchange and other risks associated with the importations of sustainable materials (such as warranties, timelines, skills working with non-standard materials, insurance and import duties) • Lack of financial schemes and incentives

Green building barriers

Political and legal

The political and legal environment has a significant effect on the green buildings market. Weak standards and/or poor enforcement adversely affects the development of a high-performing market by reducing the cost of non-compliance (Marsh et al., 2020). Since 2011, mandatory energy efficiency building standards in South Africa had complete segment coverage, although these have been inconsistently enforced (e.g., across building types and localities). Although more ambitious and comprehensive than previous versions, the energy efficiency building standard SANS10400-XA 2021 Edition 2.00 (SABS, 2021) coming enforce 16 November 2021, may be similarly inconsistently enforced as preceding standards, without efforts to address these implementation challenges to market transformation.

Information, awareness, and knowledge

Information asymmetries within the market, a lack of knowledge and expertise related to green buildings, as well as limited knowledge and awareness of the benefits of green buildings all contribute to lessened demand for green buildings. Robust, and coherent rating systems, and certifications, which can improve material innovation, increase awareness and understanding in the market – among developers, owners, tenants and financiers (Marsh et al., 2020). Although there are several voluntary certifications for green buildings in South Africa, these certifications can be costly, particularly for homeowners, compounding perceptions that the construction of and refurbishment to green buildings are more costly than ordinary buildings.

The assessment of buildings' and building portfolios 'greenness' differs between certifications, and the due diligence approaches of financial institutions. A lack of clarity on what qualifies as green can lead to missed opportunities, and inconsistent definitions limits comparability of options. Limited availability of robust data about the current building stock makes it difficult to assess the performance of existing portfolios and baseline for efficiency improvements. The assessment of eligibility of buildings for green finance products is hampered by a common database and robust, consistent, and comprehensive data.

Economic and financial

Green buildings, particularly green certified buildings are often seen as more costly than ordinary buildings in terms of initial costs, design styles, availability of local green building products, and availability of qualified and skilled professionals, all contributing to making green buildings less attractive. In addition, the difficulty in quantifying the financial benefit can hamper investments. Some of these challenges remain only as market perceptions, for which continued efforts to raise awareness and address market inertia will be needed.

Contributing to the higher risk perception by financial institutions are discussed in greater detail below.

Challenges for finance providers

Scaling up green building financing across building segments is essential to supporting South Africa meet its decarbonisation goals. Current investments in green buildings are a small fraction of the opportunity and insufficient to meet climate targets, despite growing interest of investors in the market. A further challenge

to this is ensuring social inclusion – that green building investments include lower-income housing and remains affordable.

Green investments make up less than 1% of investments by pension funds, and of those that do make green investments, only a fifth of pension funds invest in green buildings and real estate (IFC, 2020). A lack of green investable products and pipeline of bankable projects, followed by difficulty monitoring and reporting on climate impacts of investments and lack of guidelines regarding green investing are among the most significant challenges to green investing by pension funds (IFC, 2020).

The project team discussed perceived challenges, consulting with all major South African commercial banks and the Banking Association of South Africa (BASA). The team also separately engaged First Rand Bank, the GBCSA and the IFC EDGE technical and in-country teams.

The following points were noted:

- BASA, having consulted its membership and with a focus on the residential market, noted that use of IFC EDGE (Excellence in Design for Greater Efficiencies) and/or GBCSA Green Star schemes as the central recognition elements of a South African taxonomy’s MSC TSC, without a process and cost review, was considered problematic and a simplified product/process substitution is required.
- BASA further noted;
 - a. For the residential market, it was recognised that as municipal bylaws are progressively strengthened, green building certification for this asset class has become ever more viable. However, a strong concern was raised regarding the upfront costs of certification and view that in the long run, the cost savings gained from obtaining green certifications do not provide sufficient financial compensation for a long-term mortgage repayment and the interest incurred on the loan.
 - b. Costs of recertification were raised, which appeared to reside in misunderstanding of the certifications’ respective technical requirements and banks’ own concerns with wanting to ward against green default after initial certification and financial transaction.
 - c. For commercial and industrial buildings, bank lending to this class is substantive and clarification as to what performance level and/or recognised certifications incorporated into the SA GFT would be valuable. The same concerns were voiced regarding the cost of certification compared with capital efficiencies gained because of being a green building.
 - d. Banks aired the view that there is no universal standard for what constitutes a green building in South Africa – citing different certifications without clarity of their ‘ambition’ and comparability. As such, BASA proposed that details of what constitutes a green or net-zero building, only then would it be a viable proxy in the development of a taxonomy.
- Banks were giving consideration for how to identify the intrinsic and extrinsic benefits of energy and resource efficiency and translate this into financial risk modelling and benefits pricing for financial products. It was considered that there was growing but still insufficient data and data

systems available to clarify this for product design, although there was much interest in doing so – including through cooperative models and working with 3rd party data providers.

- It was noted that building owners (especially residential) might be inclined to upgrade or install renewable energy generation independently, and that this would contribute towards ‘greening’ the building, although it was difficult to track for financiers with an interest in knowing these responses by mortgagees.
- It was identified that EDGE Level 1 or similar ‘entry level’ type certifications were of interest as a minimum requirement, and the current focus for commercial transactions development.
- Throughout the consultations, concerns were raised around financial inclusivity of green building labelling, especially considering low cost housing.
- The IFC raised that diversity of certification offerings may be positive for market development and market choice, given that each would have benefits and challenges and be suited to different segments and typologies. These might each be accepted as a national standard for “green”.
- It was raised by both the GBCSA and IFC that market understanding of the offerings appeared inaccurate, and that the certifications available in South Africa had already received various international and domestic recognition as green building standards.

Financing green building products in South Africa

Despite these challenges, the appetite for investing in green buildings in South Africa is growing. Financial institutions are aligning their building portfolios to green objectives and the net zero ambitions of South Africa (Beck, 2021). Financial institutions are pushing ahead and rolling out green products for the buildings sector.

- In 2018, Growthpoint Properties issued a Green Bond on the Johannesburg Stock Exchange (JSE), to refinance green properties, linking their green buildings portfolio with capital markets (Property24, 2018).
- Nedbank for instance offers an extension to their home loan product where energy saving products from specified suppliers can be included in the loans (Nedbank, 2022). In December 2021, Nedbank issued a green bond, anchored by the IFC, to fund green residential developments, the first green bond by a commercial bank in Africa focused on green housing (IFC, 2021a). Multiple Nedbank office buildings in South Africa have been certified as being green by the GBCSA (Nedbank, 2012).
- In 2020, ABSA launched South Africa’s first green home loan, ‘ABSA Eco Home Loan’ providing preferential interest rates on green homes (IFC, 2021b).
- FNB Eco Home Loan launched in December 2020 providing improved preferential interest rates based on the level of EDGE certification achieved. (IFC, 2021c)
- Standard Bank provided Sustainability Linked Facility to Equites Real Estate Investment Trust (REIT) for improving green building design efficiencies on their warehousing portfolio. (IFC, 2021c)

- Rand Merchant Bank (RMB) arranged a sustainability-linked bond to support Redefine Properties address carbon emissions and improve sustainability across their portfolio and transacted a green loan for Transend to finance eligible assets for the affordable rentals market (identifying IFC EDGE Level 1 for one of its buildings) (RMB, 2022a; RMB, 2022b).

As sustainable finance becomes mainstream, there has been increasing interest in finance taxonomies as tools to help provide clarity and certainty in selecting investments into new buildings, and retrofits, aligned to sustainable outcomes. A taxonomy can support investors and owners to manage the risks associated with a low carbon transition as it brings about regulatory and economic changes, rendering inefficient assets less and less profitable.

A key objective of the updated buildings definition of the SA GFT is to provide the financial sector with additional clarity and certainty in selecting green building and net zero investments. It is also a tool for communication between policy makers, industry, and investors, offering a common language and set of goals to support target setting and alignment to ambitious national decarbonisation objectives. While the SA GFT technical standards may not be the tool best suited for addressing many of the barriers and needs, but is an essential complement to the areas of work and progress in the sector.

Moving towards a definition of green buildings

The initial green building definition under the SA GFT

An initial draft of the buildings' definition included in 'beta' or early draft-version of the South African Green Finance Taxonomy (SA GFT) was developed in 2021.

It was drafted in such a way as to align it with taxonomic 'best practice' exemplified by the EU's Green Taxonomy and incorporating South African buildings regulations and emerging energy performance certification system. This meant adopting a definition of green buildings in line with the EU definition – for new buildings, energy performance is required to be 10% lower than the threshold set by EU 'nearly zero energy building' (NZEB) requirements, and EPCs are used to evidence this.

However, following a review by key stakeholders in the South African market, it was determined that the initial draft for the definition of green buildings may not wholly appropriate for the South African context. Two main concerns were raised with the initial draft of the buildings section of the Drafted SA GFT:

- The first was that the definition provided was not based upon existing certification tools largely accepted in South Africa, such as the GBCSA's Green Star and IFC EGDE which have been modified for the South African context
- These same certifications are coming into greater use in the few recent instances of publicised green buildings financial transactions and would point to market understanding and endorsement for them.
- The second criticism was the use of EPCs to define a new building's green credentials with respect to energy efficiency, given:

- a. That South African EPCs regard building's operational phase and only relate to existing buildings (all buildings must have been in operation for a minimum of two years). The inclusion of EPCs in the definition for new builds would therefore obviate recognition.
- b. The nascent EPC market in South Africa. Although EPCs for most commercial buildings are mandatory from December 2022, as at the end of 2021, only one EPC had been issued at the date of engagement, and EPCs are not required for residential buildings. Additional information on EPCs in South Africa is found in the Annex.

In the subsequent review and update of the draft for publication in April 2022, such concerns raised have been considered. A dual approach has been adopted:

- As a taxonomy-design principles-aligned benchmark, it has been the approach of the project team to ensure a net zero carbon standard is included; this comprises a 'top-level' ambition and is aimed to be in-step with actors driving ambitious market transformation. Achieving this MSC whilst meeting all other requirements of the taxonomy, would qualify the economic activity as 'taxonomy aligned' and a further statement of performance for this sector of 'top-level' alignment can be expressed.
- This is supplemented to provide for the challenges and the ultimate ambition of market transformation. I.e., market transformation encouragement objectives supersede other principles of design. In this supplement to the MSC Technical Screening Criteria, two further options have been allowed: 'entry-level' and 'mid-level' which would still qualify for taxonomy alignment. Given this differentiated approach, transparency is vital, and the qualifying economic activities must include a further statement of performance for the level achieved.

This is particular to the environmental objective for 'climate change mitigation'. This sets a precedent for future development of recognition for other environmental objectives. The requirements for the environmental objective 'climate change adaptation' remain the same as before.

The differentiated approach for green buildings in South Africa

The 1st Edition South African Green Finance Taxonomy Technical Screening Criteria has sought to align with such national ambitions, whilst appreciating the need to encourage market transformation from a very low base with only nascent and occasional 'green building' activity. As introduced above, the market development challenges appear to call for a differentiated approach not followed in other Technical Screening Criteria, i.e., a recognition for progress towards net zero.

This approach is challenging, given the typical lifespan of buildings, wherein a 'lower quality of green' is essentially locked-in (unless there is motivation for further refurbishment and renovation, with added expense). However, noting that the South African building portfolio is presently highly inefficient, even introduction of 'entry-level' green performance requirements, depending on the rate of adoption, would have marked impact on environmental and energy security performance, and realise use and cost benefits to occupants and owners. What the differentiated approach therefore seeks to achieve is:

- Setting the bar as a 'stretch but achievable' goal³, helps encourage positive behaviours. For those market participants for which green performance was not previously a consideration and may have been foregone, 'entry level' performance thresholds seek to encourage their reconsideration and selection for greater ambition.
- For those presently opting for 'entry-level' development and transactions (as noted in the previous section), encourage financiers to develop and offer mid-level and top-level performance products, and encourage developers and owners to study technical and financial benefits and opt for these higher quality performance levels.
- As activity in green buildings development and financing increases, we anticipate greater competition in both financing cost benefit and green performance ambition.
- Growth in these activities can contribute to the needed evidence base concerning the benefits of higher environmental performance, extricable from intrinsic and extrinsic property attributes that affect consumer decision-making. In turn, this may allow financiers to better measure and communicate benefits and calibrate financial models.
- The differentiated approach is also intended to contribute towards increase general demand-side awareness of green buildings performance benefits, an effort that market actors are already engaged in.
- Consequently, it is envisioned that eventually the 'entry level' recognition will be phased out from the SA GFT. I.e., Because this is a market transformation encouragement model, we foresee a time when the 'entry level' option is removed from the Buildings Make Significant Contribution (MSC) Technical Screening Criteria (TSC), existing recognised assets provided continued recognition whilst new buildings not qualifying but encourage to attain higher quality requirements. Buildings attribute registers (such as the SANEDI NBPER and others) will be essential monitoring tools for market activity and portfolio performance understanding, to judge the appropriate timing for this.

Therefore, if the precedent is set that existing green building standards operational in South Africa allow qualification under the taxonomy, the specific contribution must still be recognisable with respect to a specific environmental objective (e.g., climate change mitigation or climate change adaptation) and must also still demonstrate that the activity does not trigger the Do No Significant Harm criteria. I.e., purely achieving a Green Star rating or/and EDGE certification etc., will not in itself qualify the building as green according to the SA GFT.

The following challenges have also been considered:

- This divergence of development approach is experimental, and an instance of South African domestication for taxonomic design that will need to be carefully managed for international investors.

³ As perceived presently by the market, and not related to studied system or capital efficiency or technology availability.

- It may be in time, as a transition taxonomy is developed for the country, that the ‘entry-level’ and ‘mid-level’ attributes, are relocated into that taxonomic chapter.
- Developing what would in effect be ‘transition’ criteria for other economic sectors is not possible, given the timing and effort required to do so holistically – hence the second phase of project development that makes progress towards this.
- However, although the market activities come from a low base, given the growing number of transactions and claims being made in this space, it was essential to establish a definitional component for Buildings in the SA GFT to nudge near-term transactions towards greater ambition and definitional harmony.

Net Zero, and ‘greenness’: developing the top-level definition

The aim of the definition provided by the SA GFT is to “set the bar”, around which market activity should rally and drive deep cuts in emissions from the building sector across the economy. The project acknowledges the South African context; and appropriate instruments should encourage transition towards the definition, so the sectoral performance gap is eventually closed.

Current green building standards, such as LEED in the US, BREEAM in the UK and Green Star in South Africa and Australia tend to focus on a broader definition of what constitutes ‘green’. Carbon emissions performance is one component of multiple somewhat inter-related sustainability considerations. Consequently, a building scoring higher in green performance, may still have poor emissions performance owing to high scores in other aspects (CBI, 2019.).

The term net zero carbon (NZC) has relevance to South African climate policy. Achieving zero carbon has typically focussed only on operational energy, the definition, in line with international and domestic best practice, has expanded the scope to in-use performance, and encompasses the whole life carbon impacts of new and existing buildings.

While there are indeed a range of categories and measures of ‘greenness’ that benefit the environment and society in different ways – such as improved air quality, waste management, biodiversity management and occupant wellbeing - the urgency of the climate crisis, and rapid reductions in emissions required to meet national net zero targets necessitates action in the buildings sector on this front. There is also opportunity and necessity to do so on many fronts and continue to support and upscale the substantial efforts already undertaken by industry actors, to address different obstacles in the different buildings and operations segments. Therefore, we suggest that the 1st Edition SA GFT – while imperfect – should make a start and focus where there is most opportunity to do so, then build out from there.

As can be seen in the Figure 1 below, a Net Zero building is considered to be a green building, and as such the terms within this document, and within the SA GFT have been used interchangeably. While a building could be considered to be, to varying degrees, ‘green’ where it considers additional aspects, such as wellbeing, water, waste and so on, for the purposes of this first definition, a green building must necessarily consider the elements that constitute a net zero building: climate mitigation through energy efficiency (including embodied emissions) and renewable energy (including offsetting).



Figure 1 A Net Zero building is a green building, though a green building is not only a net zero building but one that may encompass improvements in areas including for example: waste, water, air quality and wellbeing

The principles of the SA GFT are beneficial to overall sustainability performance, as the combination of ‘Make Significant Contribution’ (MSC principle) to at least one environmental objective (in this case, climate change mitigation) whilst simultaneously ensuring to Do No Significant Harm (DNSH principle), at the very least promotes minimum environmental performance in the other environmental objectives.

Underpinning principles for the taxonomically defined buildings standard

Best practice principles adopted as part of the SA GFT top-level definition

Notwithstanding the challenges to the initial draft definition and the need to better articulate feasible and supported approaches for the South Africa context, the SA GFT definition of buildings, it remains a central (and increasingly supported and used) tool that aligns with international best practice and sets *minimum standards with high ambition*. It is a concern that setting less rigorous standards would introduce additional obstacles as international investors could not trust the sufficiency or would need to undertake additional diligence – creating disincentives for capital flow. Therefore, the **requirement for qualifying economic activities in this sector to state the level of ambition**.

Best practice principles, such as those adopted in the EU Green Finance taxonomy have been incorporated into the development principles and ambitions of the SA GFT top-level MSC TSC. Broadly, these reflect principles to:

- Deliver a robust, credible, market-led development process, that reflects stakeholder engagement, consensus, and broad-based support, draws from and is in line with international practice for development and results, and draws on data and evidence where possible, follows good practice otherwise.
- Deliver a first taxonomy that supports users and is responsive to their needs, in so much as it allows users to identify ‘green’, credibly, is practical and easy to use, suitably covers user priority areas

- Ensure it is a dynamic credible tool that drives the national ambition, by being responsive to the evolving South African context and development priorities, but still aligns with international best practice.

In practice, and in the case of the building's definition, the ambition to be responsive to both national context whilst being in line with international practice, has proven challenging to reconcile.

Best practice principles for net zero buildings

The role of the SA GFT top-level MSC TSC

Specific to the case of buildings, the definition is further guided by international principles for green buildings, such as those set out by the World Economic Forum, and World Green Buildings Council under their Advancing Net Zero initiative commitments. The revised top-level green buildings definition of the SA GFT seeks to incorporate these international best practice principles and objectives in proposing a net zero carbon buildings standard. While other market-based net zero norms and standards are in varying stages of market readiness and use, the objective of the SA GFT is to be an agnostic national tool. In that capacity, it recognises the importance to accommodate existing (already well accepted) standards, regulations and recognises the use of existing certifications within the country, without compromising ambition and a rigorous approach.

Integrating to wider principled architecture

In the first instance, it is valuable to align with emerging leading practice principles, to ensure that specific definitions and activities to transition / align the buildings sector are coherent within holistic or ecosystem approaches. In this regard, the World Economic Forum's 10 Green Building Principles, (WEF, 2021) and the World Green Buildings Council's Advancing Net Zero initiative (WGBC, 2022) commitments are especially pertinent.

1. **Adopting a data driven approach**, requiring a robust calculation of carbon footprints in housing and commercial portfolios. Through gathering data to inform low carbon options, targets can be set, best practice methods can be incorporated.
2. **Reducing consumption and optimise energy demand** through an outcomes-based approach. This means setting targets, including interim targets such as reducing at least 50% of their emissions by 2030 to achieve net zero by 2050, and developing action plans for reduction of energy consumption based on best available approaches for the country. There ought to be annual reporting of verified progress.
3. **Measuring and recording embodied carbon** associated with materials and construction processes for both new builds and renovations. The World Building Council estimates embodied carbon will represent half of the carbon footprints of new builds by 2050, so use of low-carbon materials, and adopting a circular economy approach will be essential to supporting the attainment of net zero status.

4. **Maximising clean energy generation** on-site, and ensuring off-site energy is procured from renewable sources where possible. Offsetting should be used where 100% energy from renewables cannot be obtained.

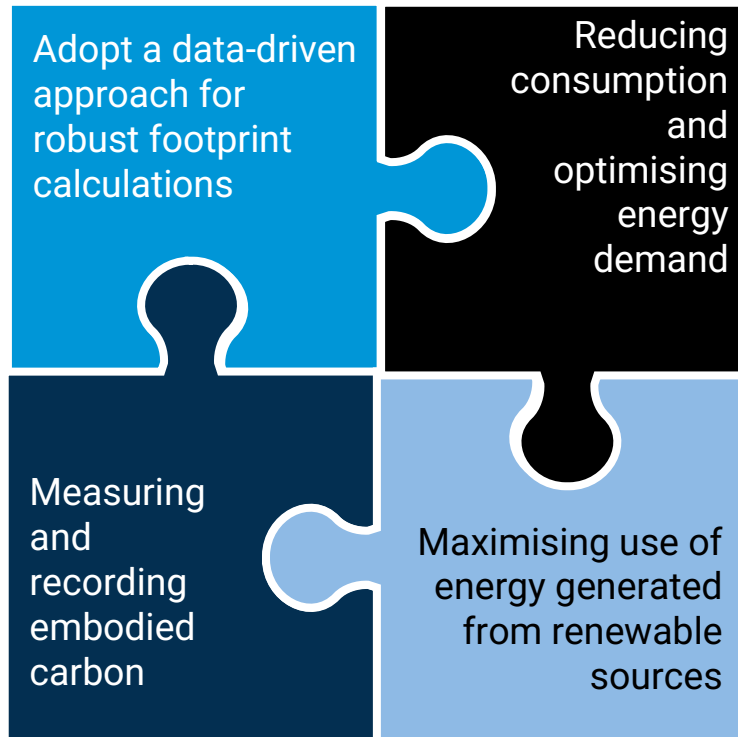


Figure 2 The Green Building Principles framework for net zero buildings (Source: WEF, 2021)

Further to these above principles, in line with Climate Bonds green property standards' principles (CBI,2020), the green buildings definition for net zero should enable financial institutions and other users of the definition to compare investments' impacts on emissions. Metrics used to assess the different dimensions of 'greenness' should be comparable and openly available, the approach transparent and robust. Furthermore, ongoing monitoring and verification should be able to be applied to ensure continued integrity of the assets. However, it is important to note that costs of assessment and verification should not be so great as to impede large sections of the market from compliance with the definition.

The Road to Net Zero Carbon Buildings

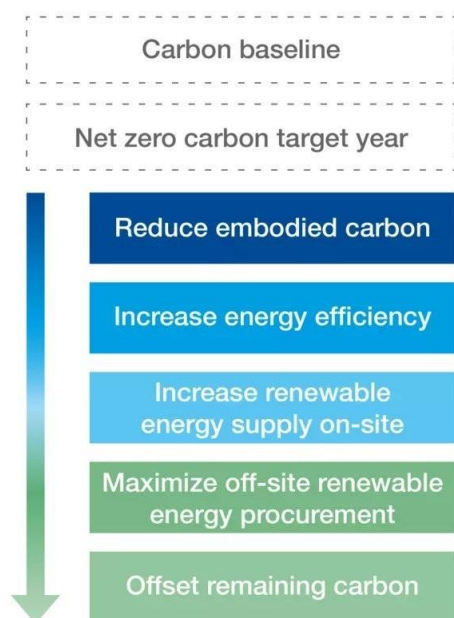




Figure 3 The Green Building Principles framework for net zero buildings (Source: WEF, 2021)

The key functional elements of the top-level Buildings Standard

The definition is divided into two areas: construction (new build) and renovation, each covering residential, commercial and industrial buildings. At this time, an **operational definition** has not been included as a standalone definition. However, operational improvements are assumed to be enabled by green building construction investments or investments in major refurbishments.

Table 2 Simplified depiction of the typologies and buildings stages covered by the 1st Edition SA GFT definitions

	New build	Existing Building	
	Construction	Major Refurbishment	Operational
Residential	✓	✓	
Commercial	✓	✓	

Industrial			
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In line with the aspects of Figure 3, the net zero building definition includes the following elements:

1. Energy consumption reductions or improvements, through:

- a. Reductions in embodied carbon or energy: Embodied carbon and embodied energy are metrics used to evaluate the environmental impact of a building’s materials. Embodied energy reports the total energy used in the production of building materials. This includes all the energy consumed through upstream value chain activities such as mining, processing, manufacturing, and transportation of building materials. A low-carbon, or a net-zero building requires that building developers prioritise sourcing materials with low embodied energy (Kapoor, 2017). Embodied carbon estimates the contribution of the building materials’ production processes to climate change, including non-energy related emissions and sequestration impacts. Due to limitations on data available, embodied energy rather than embodied carbon are used in the building’s definition of the GFT. The EDGE Emerging Economies Construction Dataset for embodied energy of construction materials is used for calculating embodied energy in South Africa and is calculated using the following formula:

$$\text{Embodied energy per unit area (MJ/m}^2\text{)} = \text{thickness (m)} \times \text{density (kg/m}^3\text{)} \times \text{embodied energy (MJ/kg)}$$

- b. Energy efficiency improvements: The current green buildings definition in the SA GFT is primarily focused on energy efficiency: the aim of the standard is to drive the energy consumption of a building as low as possible. Minimising energy consumption starts with building design – efficiently designed buildings and systems will require a much lower level of heating and cooling required to keep occupants comfortable. In South Africa, a well-designed building can operate with limited heating and cooling for much of the year.

2. Renewable energy maximisation:

- a. Renewable energy on-site, followed by offsite should be maximised. The current definition seeks to ensure that net zero buildings are generating and utilising as much renewable energy on-site as possible in the first instance. Once energy efficiency measures have been maximised to the point of meeting or exceeding the definition for energy efficiency in the GFT, these net zero buildings should seek to meet energy needs by on-site generation. Where on-site generation for all energy needs is not feasible, off-site generated renewable energy ought to be purchased.

Noting current challenges with procurement of off-site renewable energy at present in South Africa (renewable energy represents a small percentage of electricity generated), the definition with respect to renewables is to maximise renewable energy use. Renewable energy certificates (RECs) for purchased off-site electricity generated by renewables serve as evidence.

In line with other best practice definitions appropriate to South Africa, the following have also been included:

- 3. Minimum social safeguards:** the SA GFT models the EU by requiring companies to implement policies, procedures and governance mechanisms that put into effect the UN Guiding Principles on Business and Human Rights, the OECD Guidelines for Multinational Enterprise and the principles related to the International Labour Organisation (ILO) core labour conventions, as is done in the EU. In addition, the SA GFT localises requirements by including conformance with South Africa labour law.

While not required by the current iteration, the definition makes recommendations to address the following:

- **Offsets:** Offsetting the remaining difference in energy consumption once energy efficiency has been improved to the minimum threshold per the definition, and electricity consumed is from renewable sources, the residual energy consumed from fossil-fuel generated sources should be offset. By funding emissions reduction projects, the offset investments should compensate fully for residual emissions.
- **Other green indicators:** The current definition does not include standards for environmental standards beyond energy and water, such as waste, air quality and wellbeing. Although important considerations in ensuring environmentally sound construction and operation in the building sector, the alignment of the definition to net zero has been prioritised in this current version. It is important to note that this definition of green buildings is not static and will be reviewed periodically to not only support more stringent definitions in terms of carbon and energy, but also to incorporate additional environmental and social measures.

Metrics

Emissions reduction baseline

The definition of an energy efficient building per the SA GFT definition relies on a baseline upon which to calculate a percentage improvement in energy efficiency. For the South African market,

- The current SANS10400-XA 2021 standard for energy efficient buildings has been chosen as the baseline for new buildings.
- For major refurbishments and renovations of existing buildings, a performance improvement relative to the building's own baseline has been defined.

SANS10400-2021 standard was released on 16th November 2021. The prior national standard had been in effect since 2011. Despite being a requirement for approval on building plans, actual on-site compliance has been low, with many cities reporting capacity for inspection and enforcement as being limited. Additionally, verification of proposed limits is difficult to prove without commissioning ne energy modelling expertise. However, the 2021 version of the standard is more ambitious than the 2011 version. It is also currently used to determine energy efficiency compliance to attain green building certification in South Africa, such as through GBCSA Green Star and IFC EDGE.

Methodologies that rely on market performance data, such as that recommended by CBI, requires data from the ongoing monitoring and verification of building performance. The CBI green buildings methodology (verified property approach) proposes an ongoing improvement trajectory calibrated from local market

performance by carbon intensity (kg CO₂/m²). In the South African context at the present time, obtaining such data would be a challenge given mandatory energy reporting is required⁴. As an effective 'pull' mechanism to continuously move the market to greater efficiencies, such an approach ought to be considered as the market matures and data improves in both coverage and robustness.

Target: % reduction based on best practice

Any investments in energy efficiency improvements and in reducing electricity consumption from non-renewable sources for buildings is critically important. However, the urgency needed for addressing emissions from buildings requires not just improvements, but *significant* improvements of the building. The risk of locking in weaker performance is great given the relatively lengthy investment periods in building stock. A more stringent improvement in energy efficiency relative to the market will push the market towards making substantial improvements rather than making modest impacts over the investment period which may occur in a decade. This is the ambition of the top-level recognition in the 1st Ed. SA GFT MSC TSC for climate change mitigation.

Following a review of different energy efficiency improvement targets in South Africa (see Appendix 2: Review of emissions reductions targets for buildings in South Africa and globally) and recommendations of key stakeholders, a 40% improvement on the baseline⁵ for top- and mid-level recognition, and 20% improvement on the baseline for entry-level recognition, have been proposed for the energy efficiency. Measures regarding embodied energy are also described.

Aligned with more stringent and ambitious certification targets for net zero carbon, such a target across these elements could support significant improvements, over modest improvements in efficient and in driving down emissions in the sector.

Periodically such a target ought to be reviewed and increased to ensure continuous improvement, and a 'ratcheting up' of ambition.

⁴ Though EPCs will be mandatory from December 2022 for all commercial buildings, uptake is likely to be sluggish and enforcement limited at least in the near-term.

⁵ Baseline for new build in the SA GFT is the national standard; baseline for existing buildings' renovation is own building baseline.

Net Zero Carbon Buildings Alignment

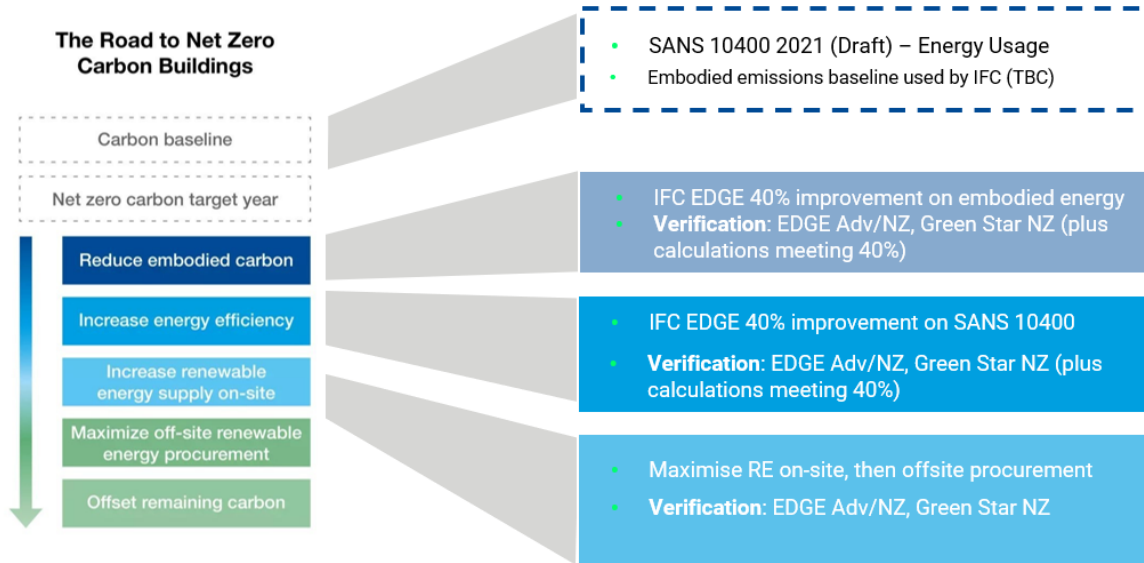


Figure 4 Adapting the Net Zero Carbon Buildings roadmap for the South African context (Source: WEF, 2021)

Verification and adoption

Certification schemes identified in the SA GFT differ in terms of verification timing and requirements. Certification by appropriate entities can support verification and provide investor / financier confidence. However, as noted earlier, costs of certification can be a deterrent for many developers, which contributes to slowing the growth of the green buildings market.

The GBCSA Green Star and IFC EDGE certifications are each already widely applied in the South African market, and include initial and some repeat verification, according to their specifications.

The 1st Edition SA GFT does not make specifications concerning required performance verification, which is considered a mechanism that market participants are to define in terms of the determined transaction risks and appropriate risk management.

Do no significant harm: other environmental objectives

In addition to energy and carbon related improvements considered in the SA GFT MSC TSC for climate change mitigation, the SA GFT buildings definition seeks to ensure that buildings – both new and existing do not result in significantly detrimental effects to other environmental aspects. These include climate mitigation and adaptation, protection for ecosystems and biodiversity, pollution prevention and sustainable resources:

- Climate change mitigation:** buildings built or used for purposes associated with the extraction, storage, transportation, or manufacture of fossil fuels cannot be considered green buildings under the SA GFT definition of green buildings.

- **Water:** Water crises in South Africa have highlighted the need to address the challenge of water scarcity through building design and use. A requirement to improve building design and operation to reduce water use under the taxonomy will additionally lower water utility bills for owners and tenants. Additional conformance requirements are introduced to prevent worse-than-industry-average water consumption performance, relying on GBCSA energy and water tools for reference. Draft national water codes may also be referenced in future.
- **Ecosystem protection and biodiversity:**
 - Green buildings cannot be built in areas that designated World Heritage, IUCN Critical Biodiversity Areas or other areas deemed in need of protection under the National Environmental Management Biodiversity Act (Act 10 of 2004) under the taxonomy. However, there are certain exemptions from this, where the building fulfils a function to support the protection of an area, for example, visitor centres and museums.
 - Most timber used in buildings need to be reused/recycles or from sustainably managed sources (and certified as such).
- **Pollution prevention:** building components and materials must not contain harmful chemicals such as asbestos, and must comply with the National Environmental Management Act, 1998 (Act No. 107 of 1998), the Hazardous Substances Act, 1973 (Act No. 15 of 1973) and the Occupational Health and Safety Act No. 85 of 1993. Efforts towards buildings not being designed in such a way as to deter from transportation system transformation have also been included, referring to GBCSA technical manuals and thought leadership in this regard.
- **Sustainable resources and circularity:** green buildings under the definition need to demonstrate a degree of resource sustainability and circularity. This means demonstrating how designs enable buildings to be disassembled such that components are more easily recycled or reused. Efforts towards buildings not being designed in such a way as to deter from recycling in operational phases have also been included, referring to GBCSA technical manuals and thought leadership in this regard.

Buildings must first necessarily comply with national standards for adaptation, climate mitigation, and environmental and social impacts before assessments of energy consumption, water and other do-no-significant-harm criteria are applied.

Looking ahead

Limitations of the definition and ratcheting up

The definition is set for a context where it is unrealistic to expect reliable annual reporting for the purposes of verification. The definition relies on abatement improvements against the prevailing building code standard for energy efficiency.

The SA GFT definition is a starting point that enables a differentiation between building portfolios in terms of their energy/carbon intensity performance. It is a qualification until a more robust repository of energy consumption data for buildings (commercial and residential) is available.

The three levels included are intended, similarly, as starting points. We fully anticipate that in future editions of the SA GFT, the governance mechanism will be utilised for robust oversight of continued enhancements for the building's standard, amongst others.

However, including the MSC TSC for climate change mitigation at this stage is a vital foundation and market signal, that could drive improvements in performance measurements and data disclosure for improved monitoring and data collection.

Future inclusions

Offsets

Buildings should be seeking to reduce carbon before resorting to the purchase of offsets. Realising a net zero carbon future ought to mean the phasing out of offsets. Principles for offsets have not been yet included in the taxonomy, though it is important to set out a plan for transitioning the use of offsets out of the taxonomy over time.

Whole-life carbon

Understanding the carbon impacts of a building from pre-design, through to deconstruction and disposal stages, or the whole life of the building is still a challenging area as significant gaps remain in the availability of data on embodied carbon of specific projects.

Support to accelerate the net zero buildings market

It is envisioned that the SA GFT buildings definition is a necessary step to consolidating definitions in support of the financial sector in South Africa, building on and seeking to complement the green building ecosystem development in South Africa.

Critical to the accelerated uptake of green buildings practices and sustainable construction and ensuring these are aligned with net zero carbon ambitions and the taxonomy, are encouraging and supportive policies and continued support to key market actors.

Appendix 1: The definition/GFT standard for green buildings

Construction of new buildings definition

Sector classification and activity	
Macro-Sector	Construction
SIC Code	41000
Description	Construction of new buildings. This relates to activities under SIC codes construction of buildings.
Make Significant Contribution criteria	
Climate Change Mitigation	
Objective	<p>The construction of new buildings designed to minimise energy use and carbon emissions throughout the lifecycle can make a substantial contribution to climate change mitigation by saving large part of the energy and carbon emissions that would be associated with conventionally designed buildings.</p> <p>Condition for non-eligibility: to avoid lock-in and undermining the climate mitigation objective, the construction of new buildings designed for the purpose of extraction, storage, transportation, or manufacture of fossil fuels is not eligible. Coal, liquid fuel and gas companies, operational facilities and infrastructure are therefore not eligible.</p> <p>Use of alternative schemes as proxies, established schemes such as 'green building' certifications or building regulations and standards may be used as alternative proof of eligibility. The organisation responsible for the scheme will be able to apply for official recognition of its scheme by presenting evidence that a specific level of certification/regulation can be considered equivalent (or superior) to the taxonomy mitigation and DNSH threshold for the relevant climatic zone and building type. The official recognition of a scheme is confirmed and identified through inclusion in the relevant metrics and thresholds as an alternative approach in future taxonomy updates (as relevant).</p>
Metric and Threshold	<p>Constructions of new buildings for which the ambition is to meet a 'net zero' or 'top-level', definition:</p> <ol style="list-style-type: none"> 1. Self-reported performance: <ol style="list-style-type: none"> 1. Energy demand performance resulting from the construction of a building in kWh/m²/annum, is maximised (>40% lower than the Energy Used Intensity (EUI) stipulated in the latest
Top-level	

	<p>version of SANS 10400-XA for the relevant occupancy class of the building), incorporating maximised energy demand management measures.</p> <ol style="list-style-type: none"> 2. Use of on-site (for site sizing) and off-site renewables are maximised (to 100% renewable energy sourcing in total). 3. No fossil based back-up power is utilised where possible <p>If not independently certified as part of a recognised scheme (as below), full performance evidence to be provided with demonstration of internal performance management and reporting controls, signed by a delegated authority, disclosed to investors and clients.</p> <ol style="list-style-type: none"> 2. Alternately, the energy performance is certified for: <ol style="list-style-type: none"> 1. IFC EDGE Zero Carbon or 2. GBCSA Net Zero (Carbon Level 1, modelled), with substantive evidence that the requirements have been met: <ol style="list-style-type: none"> 1. >40% EUI threshold and maximised peak energy demand management measures 2. Maximised on-site and off-site renewables 3. No fossil-based back-up power or 3. GBCSA Green Star Level 5 or better New Build with substantive evidence that 40% threshold has been met within the Energy category or 4. Other certification schemes that have been provided official recognition, confirmed and identified through the scheme inclusion in these metrics and thresholds as an alternative approach in future taxonomy updates. 3. In either case 1 or 2, renewable energy generated on-site must be maximised in the first instance (including incorporation of storage), whereafter the purchase of off-site renewable energy is undertaken to make up 100% renewables supplied to the building. Off-site renewables may be sourced through a variety of approaches, including market instruments provided the contributions from market instruments are fully traceable, independently verified, meet the Greenhouse Gas Protocol Scope 2 Quality Criteria⁶ and details disclosed to investors and clients. 4. For commercial building larger than 2000 m², public building larger than 1000 m² and other building types (considered in aggregate for developments) larger than 5000 m²⁷, upon completion, the building resulting from the construction undergoes testing for air-tightness, thermal integrity and thermal management practices, and any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients.
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⁶ As set out at https://ghgprotocol.org/scope_2_guidance.

⁷ For residential buildings, the testing is made for a representative set of dwelling/apartment types.

	<p>5. For commercial building larger than 2000 m², public building larger than 1000 m² and other building types (considered in aggregate for developments) larger than 5000 m²⁸, the life cycle Global Warming Potential (GWP) of the building resulting from the construction has been calculated for each stage in the life cycle, efforts to minimise this performance element is detailed, and the performance and efforts are disclosed to investors and clients.</p> <p>6. Where credible regulatory and/or voluntary carbon offsets are applied beyond the measures listed above, these must be sourced from the South African national registry or credible international offset registries providing access to verified carbon credits under standards endorsed by the International Carbon Reduction & Offset Alliance (ICROA)⁹. Details to be disclosed to investors and clients.</p>
<p>Metric and Threshold</p> <p>Mid-level</p>	<p>Constructions of new buildings for which the ambition is to meet a 'mid-level', definition:</p> <p>7. Self-reported performance: Energy demand resulting from the construction of a building in kWh/m²/annum, is a minimum of 40% lower than the Energy Used Intensity (EUI) stipulated in the latest version of SANS 10400-XA for the relevant occupancy class of the building.</p> <p>If not independently certified as part of a recognised scheme (as below), full performance evidence to be provided with demonstration of internal performance management and reporting controls, signed by a delegated authority, disclosed to investors and clients.</p> <p>2. Alternately, the energy performance is certified for:</p> <ol style="list-style-type: none"> 1. IFC EDGE Advanced (Level 2), with substantive evidence that the requirements have been met: <ol style="list-style-type: none"> 1. Maximised on-site and off-site renewables 2. No fossil-based back-up power <p>or</p> 2. GBCSA Net Zero (Carbon Level 1, modelled), with substantive evidence that the requirements have been met: <ol style="list-style-type: none"> 1. >40% EUI threshold and maximised peak energy demand management measures 2. Maximised on-site and off-site renewables 3. No fossil-based back-up power <p>or</p> 3. GBCSA Green Star Level 5 or better New Build, with substantive evidence that the requirements have been met: <ol style="list-style-type: none"> 1. that 40% threshold has been met within the Energy category 2. Maximised on-site and off-site renewables 3. No fossil-based back-up power where possible <p>or</p>

⁸ For residential buildings, the calculation and disclosure are made for a representative set of dwelling/apartment types.

⁹Available at: <https://www.icroa.org/standards>

	<p>4. Other certification schemes that have been provided official recognition, confirmed and identified through the scheme inclusion in these metrics and thresholds as an alternative approach in future taxonomy updates.</p> <p>3. In either case 1 or 2, on-site renewable energy generation should be maximised (for site sizing), with details disclosed to investors and clients.</p> <p>4. Consideration of on-site storage feasibility must be made, and rationale provided for storage sizing selected (including if none). This is to be disclosed to investors and clients.</p> <p>5. For commercial building larger than 2000 m², public building larger than 1000 m² and other building types (considered in aggregate for developments) larger than 5000 m²¹⁰, upon completion, the building resulting from the construction undergoes testing for air-tightness, thermal integrity and thermal management practices, and any deviation in the levels of performance set at the design stage or defects in the building envelope are disclosed to investors and clients.</p>
<p>Metric and Threshold</p> <p>Entry-level</p>	<p>Constructions of new buildings for which the ambition is to meet a 'entry-level', definition:</p> <p>1. Self-reported performance: energy demand resulting from the construction of a building in kWh/m²/annum, is a minimum of 20% lower than the Energy Used Intensity (EUI) stipulated in the latest version of SANS 10400-XA for the relevant occupancy class of the building.</p> <p>If not independently certified as part of a recognised scheme (as below), full performance evidence to be provided with demonstration of internal performance management and reporting controls, signed by a delegated authority, disclosed to investors and clients.</p> <p>2. Alternately, the energy performance is certified for:</p> <ol style="list-style-type: none"> 1. IFC EDGE Certified (Level 1) or 2. GBCSA Green-Star Level 4 or better rating New Build, with substantive evidence the 20% threshold has been met or 3. Other certification schemes that have been provided official recognition, confirmed and identified through the scheme inclusion in these metrics and thresholds as an alternative approach in future taxonomy updates. <p>3. Alternately, and only applicable to residential buildings of any type, on-site renewable energy generation has been installed (asset finance</p>

¹⁰ For residential buildings, the testing is made for a representative set of dwelling/apartment types.

	not to be double counted). This includes, for low-income, and social housing, solar water heaters (SWHs).
Climate Change Adaptation	
Depending on the primary objective of the activity, refer to Section 8: Screening criteria for activities making a substantial contribution to climate change adaptation ¹¹ Users of the Taxonomy should identify and explain which criteria they are responding to.	
Do No Significant Harm assessment	
<p>The main potential for significant harm to the other environmental objectives associated with the construction of new buildings is determined by:</p> <ol style="list-style-type: none"> 1. Lack of resistance to extreme weather events (including flooding), and lack of resilience to future temperature increases in terms of internal comfort conditions. 2. Excessive water consumption due to inefficient water appliances and/or poor water use amenities design. 3. Landfill and/or incineration of construction and demolition waste that could be otherwise recycled/reused. 4. A failure to operationalise strategic national waste management practices. 5. Failure to design for disassembly and increased circularity. 6. Through materials use and operations, increased emissions of VOCs and formaldehyde. 7. Presence of asbestos and/or substances of very high concern in the building materials. 8. Presence of hazardous contaminants in the soil of the building site. 9. Inappropriate building location: impacts on ecosystems if built on greenfield and especially if in a conservation area or high biodiversity value area. 10. Indirect damage to ecosystems due to the use of materials and products originating from virgin sources that are not sustainably managed (refers to forestry and mining, for instance.) 	
Climate change mitigation	<p>For adaptation projects</p> <p>The building must comply with all applicable mandatory South African National Standard 204 regulations regarding energy performance.</p> <p>To avoid lock-in and undermining the climate mitigation objective, the construction of new buildings designed for the purpose of extraction, storage, transportation, or manufacture of fossil fuels is not eligible for the Taxonomy.</p> <p>Buildings' design must accommodate support for alternative transportation modes appropriate to the intended users of the building. Refer to GBCSA Green Star SA – Existing Building Performance scoring for Alternative Transportation.</p>
Climate change adaptation	<p>For mitigation projects</p> <p>The activity complies with the criteria set out in the 1st Edition SA GFT: Appendix A: Generic Criteria for DNSH to Climate Change Adaptation.</p>

¹¹ This can be located in the working draft: [South African Green Finance Taxonomy](#)

<p>Sustainable use of water and marine resources</p>	<p>Where installed, the specified water use for the following water appliances are attested by product datasheets and/or a building certification in accordance with the technical specifications laid down per:</p> <ul style="list-style-type: none"> • <u>EDGE Water Efficiency measures</u> • <u>GBCSA Energy Water Performance Tool (EWP)</u> <p>A GBCSA Green Star certification that incorporates a Water Rating result above 'Industry Average' as determined by the current version of the Energy Water Performance Tool, is acceptable for demonstrating this DNSH requirement is met.</p> <p>An IFC EDGE Level 1 certification is acceptable for demonstrating this DNSH requirement is met.</p> <p>To avoid impact from the construction site, activity complies with the criteria set out in the 1st Edition SA GFT: Appendix D: Generic criteria for DNSH to sustainable use of water and marine resources.</p>
<p>Ecosystem protection and restoration</p>	<p>The new construction must not be built on protected natural areas, such as land designated as UNESCO World Heritage and Critical Biodiversity Areas (CBAs), or equivalent as defined by National Environmental Management Biodiversity Act (Act 10 of 2004), UNESCO and / or the International Union for Conservation of Nature (IUCN) under the following categories:</p> <ol style="list-style-type: none"> 1. Category Ia: Strict Nature Reserve 2. Category Ib: Wilderness Area 3. Category II: National Park <p>Buildings that are associated supporting infrastructure to the protected natural area, such as visitor centres, museums or technical facilities are exempted from this criterion.</p> <p>The new construction must not be built on arable or greenfield land of recognised high biodiversity value and land that serves as habitat of endangered species (flora and fauna) listed on the IUCN Red List.</p> <p>At least 50% of all timber products used in the new construction for structures, cladding and finishes must have been either recycled/reused or sourced from sustainably managed forests as certified by third-party certification audits performed by accredited certification bodies, e.g., FSC/PEFC standards or equivalent.</p> <p>Buildings' design must prioritise avoidance of environmental impacts to sensitive landscapes and include hard surfaces and building exterior maintenance practices that reduce the environmental impact and improve ecological value. Refer to GBCSA Green Star SA – Existing Building Performance scoring for Land Use and Ecology Category, and Emissions Category.</p>
<p>Pollution prevention</p>	<p>It is ensured that building components and materials do not contain asbestos and the use of chemicals adhere to the National Environmental Management Act, 1998 (Act No. 107 of 1998), the Hazardous Substances Act, 1973 (Act No. 15 of 1973) and the Occupational Health and Safety Act No. 85 of 1993. Building components and materials used in the construction</p>

	<p>that may come into contact with occupiers¹² emit less than 0,06 mg of formaldehyde per m³ of material or component and less than 0,001 mg of categories 1A and 1B carcinogenic volatile organic compounds per m³ of material or component, upon testing in accordance with CEN/TS 16516522 and ISO 16000-3523 or other comparable standardised test conditions and determination methods¹³.</p> <p>A GBCSA Green Star certification that provides evidence that VOC and Formaldehyde credits are pursued, is acceptable for demonstrating this DNSH requirement is met.</p>
<p>Sustainable resource use and circularity</p>	<p>The building should minimise waste from construction or destruction going to landfill and maximise reuse and/or recycling of materials.</p> <p>Under this green building’s definition, at least 50% (by weight) of the non-hazardous construction and demolition waste (excluding naturally occurring material) generated on the construction site must be prepared for re-use or sent for recycling or other material recovery, including backfilling operations that use waste to substitute other materials.</p> <p>Disposal of waste must be compliant with the requirements of the NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT NO. 59 OF 2008)</p> <p>Building designs and construction techniques support circularity and demonstrate, with reference to ISO 20887¹⁴ or other standards for assessing the ease of disassembly for reuse of materials or adaptability of buildings, how they are designed to be more resource efficient, adaptable, flexible and dismantlable to enable reuse and recycling.</p> <p>Building design that provides for recycling during operation is required. Refer to GBCSA Green Star SA – Existing Building Performance Scoring Materials Category.</p>
<p>Comply with Minimum Social Safeguards</p>	
<p>Companies and other issuers disclosing against the Taxonomy must comply with the criteria set out in Appendix C: Minimum Social Safeguards¹⁵</p>	

Building renovation green building definition

¹² Applying to paints and varnishes, ceiling tiles, floor coverings, including associated adhesives and sealants, internal insulation and interior surface treatments, such as those to treat damp and mould.

¹³ The emissions thresholds for carcinogenic volatile organic compounds relate to a 28-day test period.

¹⁴ ISO 20887:2020, Sustainability in buildings and civil engineering works - Design for disassembly and adaptability - Principles, requirements and guidance.

¹⁵ Refer to working draft: [South African Green Finance Taxonomy](#)

Sector classification and activity	
Macro-Sector	Construction
SIC Code	41000
Description	Building renovation: this relates to activities under SIC codes 41000 construction of buildings
Make Significant Contribution criteria	
Climate Change Mitigation	
Objective	<p>The renovation of existing buildings to improve their energy performance makes a substantial contribution to climate change mitigation by reducing energy consumption and GHG emissions for the remaining operational phase of the buildings, and by avoiding emissions that would be associated with the construction of new buildings. The detailed technical screening criteria for MSC climate change mitigation are similar for renovation as for new build, given that the same end performance is the objective. Additional DNSH details apply for renovations.</p> <p>Condition for non-eligibility: to avoid lock-in and undermining the climate mitigation objective, the renovation of buildings occupied for the purpose of extraction, storage, transportation or manufacture of fossil fuels is not eligible.</p> <p>Use of alternative schemes as proxies, established schemes such as 'green building' certifications or building regulations and standards may be used as alternative proof of eligibility. The organisation responsible for the scheme will be able to apply for official recognition of its scheme by presenting evidence that a specific level of certification/regulation can be considered equivalent (or superior) to the taxonomy mitigation and DNSH threshold for the relevant climatic zone and building type. The official recognition of a scheme is confirmed and identified through inclusion in the relevant metrics and thresholds as an alternative approach in future taxonomy updates (as relevant).</p>
Metric and Threshold Top-level	<p>Major renovations for buildings for which the ambition is to meet a 'net zero' or 'top-level', definition:</p> <ol style="list-style-type: none"> 1. Self-reported performance: <ol style="list-style-type: none"> 1. Energy demand improvement through energy efficiency and demand management measures resulting from the renovation of a building in kWh/m²/annum, is maximised for the relevant occupancy class of the building. 2. The renovation incorporates and maximises (to 100% in total) use of on-site (for site sizing) and off-site renewables.

	<p>3. The renovation eliminates fossil based back-up power.</p> <p>If not independently certified as part of a recognised scheme (as below), full performance evidence to be provided with demonstration of internal performance management and reporting controls, signed by a delegated authority, disclosed to investors and clients.</p> <p>2. Alternately, the energy performance is certified for:</p> <ol style="list-style-type: none"> 1. IFC EDGE Zero Carbon or 2. GBCSA Net Zero (Carbon Level 1, modelled), with substantive evidence that the requirements have been met: <ol style="list-style-type: none"> 1. Maximising energy efficiency. 2. Maximised on-site and off-site renewables. 3. No fossil-based back-up power. or 3. GBCSA Net Zero or GBCSA Green Star Level 5 or better certification, with substantive evidence that the requirements have been met: <ol style="list-style-type: none"> 1. Maximising energy efficiency. 2. Maximised on-site and off-site renewables. 3. No fossil-based back-up power. or 4. Other certification schemes that have been provided official recognition, confirmed and identified through the scheme inclusion in these metrics and thresholds as an alternative approach in future taxonomy updates. <p>3. In either case, the renovation should incorporate renewable energy generation on-site, which must be maximised in the first instance (including incorporation of storage), whereafter the purchase of off-site renewable energy is undertaken to make up 100% renewables supplied to the building. Off-site renewables may be sourced through a variety of approaches, including market instruments provided the contributions from market instruments are fully traceable, independently verified, meet the Greenhouse Gas Protocol Scope 2 Quality Criteria¹⁶ and details disclosed to investors and clients.</p> <p>4. For commercial building larger than 2000 m², public building larger than 1000 m² and other building types (considered in aggregate for developments) larger than 5000 m²¹⁷, upon completion of the renovation, the building undergoes testing for air-tightness, thermal integrity and thermal management practices, and results and performance implications are disclosed to investors and clients.</p> <p>5. For commercial building larger than 2000 m², public building larger than 1000 m² and other building types (considered in aggregate for</p>
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¹⁶ As set out at https://ghgprotocol.org/scope_2_guidance.

¹⁷ For residential buildings, the testing is made for a representative set of dwelling/apartment types.

	<p>developments) larger than 5000 m²¹⁸, the life cycle Global Warming Potential (GWP) of the building (absolute and change due to the renovation; operational and decommissioning phases) resulting from the renovation has been calculated, efforts to minimise this performance element particular for the renovation materials is detailed, and the performance and efforts are disclosed to investors and clients.</p> <p>6. Where credible regulatory and/or voluntary carbon offsets are applied beyond the measures listed above, these must be sourced from the South African national registry or credible international offset registries providing access to verified carbon credits under standards endorsed by the International Carbon Reduction & Offset Alliance (ICROA)¹⁹. Details to be disclosed to investors and clients.</p>
<p>Metric and Threshold</p> <p>Mid-level</p>	<p>Major renovations for buildings for which the ambition is to meet a 'mid-level', definition:</p> <p>1. Self-reported performance: energy demand resulting from the renovation of a building in kWh/m²/annum, the Energy Used Intensity (EUI) is improved by 40% from building baseline, and peak energy demand measures are introduced towards maximisation of these.</p> <p>If not independently certified as part of a recognised scheme (as below), full performance evidence to be provided with demonstration of internal performance management and reporting controls, signed by a delegated authority, disclosed to investors and clients.</p> <p>2. Alternately, the energy performance is certified for:</p> <ol style="list-style-type: none"> 1. IFC EDGE Advanced (Level 2) or 2. GBCSA Net Zero (Carbon Level 1, modelled) or Green Star Level 5 or better certification, with substantive evidence that 40% threshold from building baseline requirement has been met, as well as improved peak energy demand management measures or 3. Other certification schemes that have been provided official recognition, confirmed and identified through the scheme inclusion in these metrics and thresholds as an alternative approach in future taxonomy updates. <p>3. In either case 1 or 2, the renovation should incorporate maximised on-site renewable energy generation (for site sizing), with details disclosed to investors and clients.</p> <p>4. Consideration of incorporation of on-site storage through the renovation must be made, and rationale provided for storage sizing</p>

¹⁸ For residential buildings, the calculation and disclosure are made for a representative set of dwelling/apartment types.

¹⁹ Available at: <https://www.icroa.org/standards>

	<p>selected (including if none). This is to be disclosed to investors and clients.</p> <p>5. For buildings larger than 5000 m²²⁰, upon completion of the renovation, the building undergoes testing for air-tightness, thermal integrity and thermal management practices, and results and performance implications are disclosed to investors and clients.</p>
<p>Metric and Threshold</p> <p>Entry-level</p>	<p>Major renovations for buildings for which the ambition is to meet a 'entry-level', definition:</p> <p>1. Self-reported performance: energy demand resulting from the renovation of a building in kWh/m²/annum, the Energy Used Intensity (EUI) is improved by 20% from building baseline.</p> <p>If not independently certified as part of a recognised scheme (as below), full performance evidence to be provided with demonstration of internal performance management and reporting controls, signed by a delegated authority, disclosed to investors and clients.</p> <p>2. Alternately, the energy performance is certified for:</p> <ol style="list-style-type: none"> 1. IFC EDGE Certified (Level 1) or 2. GBCSA Net Zero or GBCSA Green-Star Level 4 or better rating. In either case with substantive evidence the 20% threshold from building baseline requirement has been met or 3. Other certification schemes that have been provided official recognition, confirmed and identified through the scheme inclusion in these metrics and thresholds as an alternative approach in future taxonomy updates. <p>3. Alternately, and only applicable to residential buildings of any type, on-site renewable energy generation has been installed as part of the renovation (asset finance not to be double counted). This includes, for low-income, and social housing, solar water heaters (SWHs) introduction to structures.</p>
<p>Climate Change Adaptation</p>	
<p>Depending on the primary objective of the activity, refer to Section 8: Screening criteria for activities making a substantial contribution to climate change adaptation²¹</p> <p>Users of the Taxonomy should identify and explain which criteria they are responding to.</p>	
<p>Do No Significant Harm assessment</p>	
<p>The main potential for significant harm to the other environmental objectives associated with the renovation of existing buildings is determined by:</p> <ol style="list-style-type: none"> 1. Lack of resistance to extreme weather events (including flooding), and lack of resilience of to future temperature increases in terms of internal comfort conditions. 	

²⁰ For residential buildings, the testing is made for a representative set of dwelling/apartment types.

²¹ Refer to working draft: [South African Green Finance Taxonomy](#)

	<ol style="list-style-type: none"> 2. Excessive water consumption due to inefficient water appliances and/or poor water use amenities design. 3. Landfill and/or incineration of construction and demolition waste that could be otherwise recycled/reused. 4. A failure to operationalise strategic national waste management practices. 5. Failure to design for disassembly and increased circularity. 6. Through materials use and operations, increased emissions of VOCs and formaldehyde. 7. Presence of asbestos and/or substances of very high concern in the building materials. 8. Presence of hazardous contaminants in the soil of the building site. 9. Inappropriate building location: impacts on ecosystems if built on greenfield and especially if in a conservation area or high biodiversity value area. 10. Indirect damage to ecosystems due to the use of materials and products originating from virgin sources that are not sustainably managed (refers to forestry and mining, for instance.)
Climate change mitigation	<p>For adaptation projects</p> <p>The measures adopted to improve the resilience of the building must not increase the rates of operational carbon emissions of the building. Exceptions are allowed if it can be demonstrated that increase in emissions is necessary to carry out the measures, and there is a positive trade-off.</p> <p>To avoid lock-in and undermining the climate mitigation objective, the renovation of buildings designed for the purpose of extraction, storage, transportation, or manufacture of fossil fuels is not eligible for the Taxonomy. Such use cases to be phased out and buildings repurposed as appropriate, for which renovations to improve performance as detailed above ought to be undertaken.</p> <p>Buildings' design must accommodate support for alternative transportation modes appropriate to the intended users of the building. Refer to GBCSA Green Star SA – Existing Building Performance scoring for Alternative Transportation.</p>
Climate change adaptation	<p>For mitigation projects</p> <p>The activity complies with the criteria set out in Appendix A: Generic Criteria for DNSH to Climate Change Adaptation.²²</p>
Sustainable use of water and marine resources	<p>Where installed, the specified water use for the following water appliances are attested by product datasheets, a building certification, in accordance with the technical specifications laid down per EDGE Water Efficiency measures</p> <p>A GBCSA Green Star certification that incorporates a Water Rating result above 'Industry Average' as determined by the current version of the Energy Water Performance Tool, is acceptable for demonstrating this DNSH requirement is met.</p>

²² refer to working draft: [South Africa Green Finance Taxonomy](#)

	<p>An IFC EDGE Level 1 certification is acceptable for demonstrating this DNSH requirement is met.</p> <p>To avoid impact from the construction site, activity complies with the criteria set out in 1st Edition SA GFT Appendix D: Generic criteria for DNSH to sustainable use of water and marine resources.</p>
Ecosystem protection and restoration	N/A
Pollution prevention	<p>It is ensured that building components and materials do not contain asbestos and the use of chemicals adhere to the National Environmental Management Act, 1998 (Act No. 107 of 1998), the Hazardous Substances Act, 1973 (Act No. 15 of 1973) and the Occupational Health and Safety Act No. 85 of 1993 Building components and materials used in the construction that may come into contact with occupiers²³ emit less than 0,06 mg of formaldehyde per m³ of material or component and less than 0,001 mg of categories 1A and 1B carcinogenic volatile organic compounds per m³ of material or component, upon testing in accordance with CEN/TS 16516522 and ISO 16000-3523 or other comparable standardised test conditions and determination methods²⁴.</p> <p>A GBCSA Green Star certification that provides evidence that VOC and Formaldehyde credits are pursued, is acceptable for demonstrating this DNSH requirement is met.</p>
Sustainable resource use and circularity	<p>The building should minimise waste from renovation waste going to landfill and maximise reuse and/or recycling of materials.</p> <p>Under this green building's definition, at least 50% (by weight) of the non-hazardous construction and demolition waste (excluding naturally occurring material) generated on the construction site must be prepared for re-use or sent for recycling or other material recovery, including backfilling operations that use waste to substitute other materials.</p> <p>Disposal of waste must be compliant with the requirements of the NATIONAL ENVIRONMENTAL MANAGEMENT: WASTE ACT, 2008 (ACT NO. 59 OF 2008)</p>

²³ Applying to paints and varnishes, ceiling tiles, floor coverings, including associated adhesives and sealants, internal insulation and interior surface treatments, such as those to treat damp and mould.

²⁴ The emissions thresholds for carcinogenic volatile organic compounds relate to a 28-day test period.

	<p>Building renovation plans and techniques support circularity and demonstrate, with reference to ISO 20887²⁵ or other standards for assessing the ease of disassembly for reuse of materials or adaptability of buildings, how they are designed to be more resource efficient, adaptable, flexible and dismantlable to enable reuse and recycling.</p>
<p>Comply with Minimum Social Safeguards</p>	
<p>Companies and other issuers disclosing against the Taxonomy must comply with the criteria set out in Appendix C: Minimum Social Safeguards²⁶</p>	

²⁵ ISO 20887:2020, Sustainability in buildings and civil engineering works - Design for disassembly and adaptability - Principles, requirements and guidance.

²⁶ Refer to working draft: [South Africa Green Finance Taxonomy](#).

Appendix 2: Review of emissions reductions targets for buildings in South Africa and globally

Energy efficiency targets	Commercial				Residential			
	Baseline	New	New & Existing	Verification	Baseline	New	New & Existing	Verification
		Embodied energy	Energy efficiency			Embodied energy	Energy efficiency	
National EE Action Plan	SANS10400-XA-2022 , Max EUI: (averaged across different energy zones): 131 kWh/m ² /annum		37% improvement		SANS10400-XA-2022 E.g., Max EUI: (averaged for houses across different energy zones): 85 kWh/m ² /annum (but		20% improvement	
Net Zero cities roadmap			30% by 2025, 55% by 2030				30% by 2025, 55% by 2030	
Green Star			Projects can choose between 5% - 100%	GBCSA Green Star Certification levels 4-6			Projects can choose between 5% - 100%	GBCSA Green Star Certification levels 4-6
GBCSA Net Zero Carbon				GBCSA NZ Cert.			~30-40%	GBCSA NZ Cert.
EDGE certification (Level 1)		20%	20%	EDGE certification (free tool can be used, but will not be			20%	20%

				verified unless commissioned)				verified unless commissioned)
EDGE Advanced (Level 2)		n/a	40%			n/a	40%	
EDGE Zero Carbon (Level 3)		n/a	40% (Based on achieving Edge Advanced; there is no requirement for the EDGE Net Zero certification to demonstrate EE)			n/a	40% (Based on achieving Edge Advanced; there is no requirement for the EDGE Net Zero certification to demonstrate EE)	
EU Taxonomy			20%	EPCs			20%	EPCs
World Building council Net Zero pathway commitments			20% new build, 30% improvement for renovations				20% new build, 30% improvement for renovations	

Climate bond standard options 1	City-level emission baseline		Top 15% of the market	Actual operational data?				
Climate bond standard options 2	ASHRAE 90.1 (part of LEED standard) or equivalent stringency under other standards		30% emissions improvement Or IFC EDGE met	+ LEED gold or platinum, or equivalent for Green Star SA			Top 15% of the market in emissions performance	
Climate bonds for upgrade finance			50% improvement on carbon emissions prior to renovations					

Appendix 3: South African emissions reduction policies, standards and targets related to buildings

SANS 10400-XA

The SANS 10400-XA national standard for EE in buildings, first published in 2011 and updated in 2021. Compliance enforcement and verification has been low. Many cities report capacity for inspection and enforcement is limited, so enforcement is uneven.

The SANS 10400-XA-2021 updated standard is expected to be released in early 2022. Currently in draft form, it can be found here: <https://store.sabs.co.za/catalog/product/view/id/2143705/s/sans-10400-xa-ed-2-00/>

Further to be considered:

- SANS 1544 (EPCs) requires that existing buildings are going to display their energy performance certificate by December 2022
- 7 energy zones are designated, replacing climactic zones. These zones dictate the energy efficiency standard along with building type

Table 3 Maximum annual energy consumption per building classification for each energy zone (kWh/m²/a) per drafted SANS10400-XA:2021 ed. 2.

1	2							
	Energy zones							
	1	2	3	4	5	5H	6	7
F3 Wholesaler's store Occupancy where goods are displayed and stored and where only a limited selected group of persons is present at any one time.	125	200	155	180	185	150	125	125
G1 Offices Large multi-storey office buildings, banks, consulting rooms and similar uses with lifts and energy consuming services that operate on a typical daytime occupancy.	90	105	110	95	110	95	100	100
G1 Offices Stand-alone blocks and / or campus of buildings that form an office park but operate separately	70	150	190	145	180	165	75	75
H1 Hotel Occupancy where persons rent furnished rooms, not being dwelling units.	125	130	100	115	125	95	140	140
H2 Dormitory Occupancy where groups of people are accommodated in one room	155	170	160	175	160	160	160	180
H3 Domestic residence Occupancy consisting of two or more dwelling units on a single site.	90	100	50	80	85	60	110	110
H4 Dwelling house Occupancy consisting of a dwelling unit on its own site, including a garage and other domestic outbuilding, if any.	95	100	50	80	85	60	110	110

- Energy zones are designated per the map below.

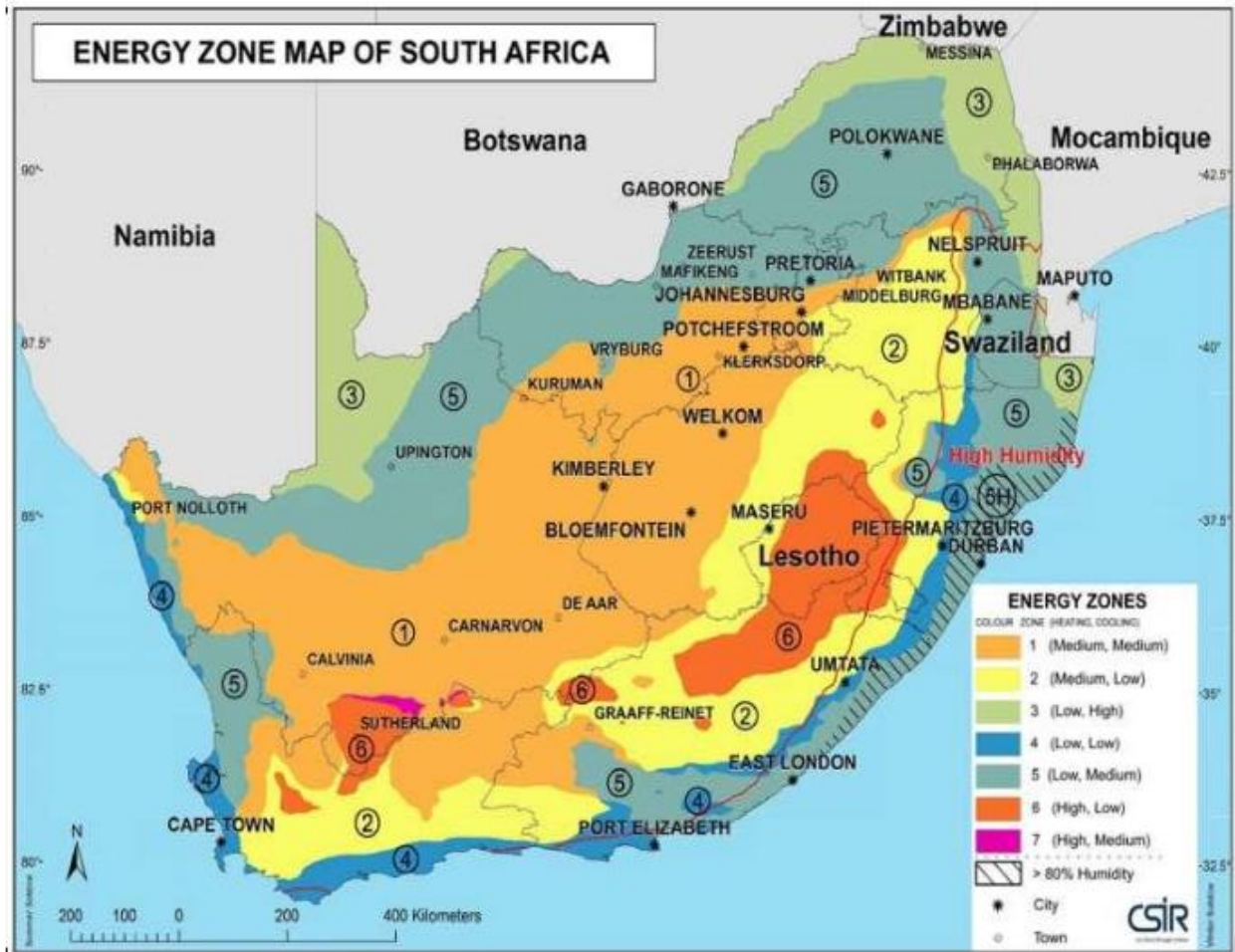


Figure 5 Energy Zone map of South Africa

National Energy Efficiency Action Plan

- National Energy Efficiency Action Plan (NEAAP) provides guidance for practical implementation. The Post -2015 NEES target is to reduce energy demand by 16% for the country by 2030 with more ambitious targets for specific sectors including:
 - 50% efficiency per m² for public buildings by 2030
 - 20% efficiency per m² for residential buildings by 2030
 - 37% efficiency per m² for commercial buildings by 2030

Other relevant policies

Other relevant national policies, regulations and initiatives relevant to buildings are summarised in the table below.

Table 4 Relevant South African national policies, regulations and initiatives relevant to buildings

	Document	Intention
2005	<ul style="list-style-type: none"> National Energy Efficiency Strategy of South Africa 	<ul style="list-style-type: none"> Sets out Energy Use Intensity reduction targets by building type and identifies need for labelling and certification programmes
2011	<ul style="list-style-type: none"> SANS 204 SANS 10400 XA: 2011 	<ul style="list-style-type: none"> Details EE building code requirements for building approval
2012	<ul style="list-style-type: none"> National Development Plan 	<ul style="list-style-type: none"> Commits to EE requirements in SA National Standards to achieve NZC building standard by 2030
2015	<ul style="list-style-type: none"> GIZ/SANEDI proposal for revised SANS 204/10400XA 	<ul style="list-style-type: none"> Revision of initial SANS 204/10400XA for consumption figures that are more suited to the EE goals aligned to the 2030 vision
2018	<ul style="list-style-type: none"> Draft SANS 10400XA 	<ul style="list-style-type: none"> Energy trajectory included, with an 8% reduction on previous maximum energy demand and maximum annual consumption every two years
2020	<ul style="list-style-type: none"> SANS 10400XA (edition 2) Energy Performance Certificates mandatory for non-residential buildings The Buildings Criteria for the Climate Bonds Standard & Certification Scheme Getting to Zero 	<ul style="list-style-type: none"> Published for public comment Mandatory Display and Submission for EPC in public and private sector building gazetted Provides all the requirements that must be complied with for building related assets and projects to be awarded Climate Bonds Certification A guide to developing net-zero buildings in South Africa
2021	<ul style="list-style-type: none"> World Economic Forum: Green Buildings Principles Draft SANS 10400XA: 2021 	<ul style="list-style-type: none"> Developed as an action plan for net-zero carbon buildings Published for public comment

Figure 6 National Policies and regulations related to buildings (Source: Ward, 2021)

Net Zero Cities targets

Under this programme, South African cities (Tshwane, Cape Town, eThekweni and Johannesburg) have signed the Net Zero Carbon Buildings Declaration established by C40 for new builds and existing buildings – the target year for net zero buildings being 2030 and 2050 respectively.

The NZC Pathway driving energy efficiency first based on percentage reductions in EUI off the national baseline. While there are no renewable energy requirements, it is assumed that onsite renewables are likely to be delivered by the market as demand for clean energy investments grows.

Table 5 Energy use intensities for different building types (adapted from: Ward, 2021)

Occupancy	Class of occupancy or building	Occupancy description	Energy Use Intensity (EUI) kWh/m ² /annum				
			2020	2025	2030	2040	2050
			SANS 10400 XA V2	SANS 10400 XA +30% EE	SANS 10400 XA +55% EE	SANS 10400 XA +65% EE	SANS 10400 XA +75% EE
			TO BE REVIEWED BEFORE 2040				
Offices	G1	Large multi-storey office	95	67	43	33	24
	G1	Standalone buildings in office parks	80	56	36	28	20
	G1	Call Centres	145	102	65	51	36
Houses	H4	Low-income houses < R450k	70	49	49	49	49
	H4	Middle income/luxury houses > R450k	70	49	32	25	18
	H5	Hospitality	70	49	32	25	18

Appendix 4: Summary of green buildings certifications in South Africa

Certification scope comparison: Asset rating vs Existing Building rating

Different certifications assess different phases, or stages, in a building’s lifecycle and it is essential to understand the distinctions between certification options with regards scope and inherent limitations. Two respective approaches prevail:

- **Asset ratings:** These are certifications used to rate new builds/construction and major refurbishments in which the building design and construction features are rated. These are typically once off asset ratings that never expire and reflect the intent of how the building was design and built to operate.
- **Existing Building ratings:** These are certifications that rating existing tenanted and owner-occupied buildings, based on a 12 month review of operational performance data (such as actual energy and water consumption). These expire and need to be recertified to demonstrate continuous on-going operational performance at a certain level of performance.

A different suite of certifications, and verification processes, exist for buildings once tenanted, to assess their operational performance and management.

Table 6 High level summary of green buildings certifications in South Africa by certification approach

Certification	Asset ratings	Existing building ratings
IFC EDGE Certified (Level 1) Advanced (Level 2)	✓	
IFC EDGE Zero Carbon	✓	✓
GREEN STAR NEW BUILD	✓	
GREEN STAR EXISTING BUILDING PERFORMANCE (EBP)		✓

GBCSA NET ZERO CARBON	✓	✓
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Table 7 High level summary of green buildings certifications in South Africa scope comparison by typologies

Certification	Commercial/office	Residential	Industrial
IFC EDGE standard & advanced)	✓	✓	✓
IFC EDGE Net Zero	✓	✓	✓
GREEN STAR NEW BUILD	✓	✓	✓
GREEN STAR EXISTING BUILDING PERFORMANCE (EBP)	✓	X	✓
GBCSA NET ZERO CARBON	✓	✓	✓

Table 8 High level summary of green buildings certifications in South Africa scope comparison by environmental impact areas

Certification	Scope of environment impact	Scope of Energy/Carbon assessment
IFC EDGE standard & advanced)	<ul style="list-style-type: none"> • Energy • Water 	<ul style="list-style-type: none"> • Modelled energy results [as an asset rating, an estimate of annual energy consumption is determined via modelling/simulation].

	<ul style="list-style-type: none"> Embodied energy of materials. 	<ul style="list-style-type: none"> Must meet a minimum 20% (or 40% for EDGE Advanced)
IFC EDGE Net Zero	<ul style="list-style-type: none"> Energy (carbon) 	<ul style="list-style-type: none"> Based on actual energy operational performance data over 12 months. The threshold is to demonstrate net zero carbon emissions over a 12 month period.
GREEN STAR NEW BUILD	<ul style="list-style-type: none"> Responsible management Health and wellbeing/Indoor environmental quality Energy Water Transport Materials Emissions Ecology, Biodiversity and Land Use management Innovation and Leadership Voluntary add on category: Socio Economic sustainability 	<ul style="list-style-type: none"> Modelled energy results [as an asset rating, an estimate of annual energy consumption is determined via modelling/simulation]. Green Star requires detailed energy modelling/simulations to be performed by the project team. Baseline: SANS 10400-XA & improvements thereon as per the Green Star Energy Modelling Guidelines Projects target a range of 5% - 100% improvement on the baseline. % improvements on baseline can easily be set and communicated by the energy results.
GREEN STAR EXISTING BUILDING PERFORMANCE (EBP)	<ul style="list-style-type: none"> Responsible management Health and wellbeing/Indoor environmental quality Energy Water Transport Materials Emissions 	<ul style="list-style-type: none"> Based on actual energy operational performance data over 12 months. For offices, this is benchmarked against EWP (energy and water performance). Projects target a range of 5% - 100% improvement on the baseline. % improvements on baseline can easily be set and communicated by the energy results

	<ul style="list-style-type: none"> • Ecology, Biodiversity and Land Use management • Innovation and Leadership 	
GBCSA Net Zero Carbon	<ul style="list-style-type: none"> • Energy (carbon) 	<ul style="list-style-type: none"> • The threshold is to demonstrate net zero carbon emissions over a 12 month period. • Modelled: Modelled energy results [as an asset rating, an estimate of annual energy consumption is determined via modelling/simulation]. • Measured: Based on actual energy operational performance data over 12 months

GBCSA Green Star

The GBCSA has the Green Star SA, which scores buildings against management, indoor environment quality, energy, transport, water, materials, land use and ecology, emissions, and innovations. A building development can receive either a 4-Star rating signalling that it has employed best practice, and a 5-Star rating which recognises “South African Excellence” or the coveted 6-Star rating indicating that the project is a world leader.

GBCSA Net Zero

The GBCSA offers their Net-zero/Net-positive certification scheme and awards projects which go beyond the partial reductions (recognised in the current GBCSA tools) and have taken the initiative to reach the endpoint of completely neutralising (or positively redressing) their carbon emissions (GBCSA, 2022).

IFC EDGE

- EDGE certification is used in 170 countries worldwide and is positioned as both a free online assessment tool, to help determine the financial viability of a green building project early in the design phase, as well as a certification system.
- The online assessment tool has been localised for South Africa to allow more accurate calculations of a building’s inputs and consumption, and presents the potential energy and water savings, and emissions reductions against a base case
- EDGE certifications are available for a range of building typologies, and quantifies environmental and financial impact of interventions implemented.

Alignment to global standards.

IFC EDGE ([IFC EDGE, 2022](#)) aligned with global standards (it can be deployed to meet the standards of):

- “**GRESB**: GRESB includes EDGE as a qualifying certification system for improved scoring for the GRESB Real Estate Assessment and the GRESB Developer Assessment. GRESB is the global standard for ESG benchmarking and is used by investors to obtain data on the ESG performance of real assets.”
- “International Capital Markets Association: The International Capital Markets Association (ICMA) recognizes EDGE as a qualifying certification system in its **green bond principles**, which are a set of guidelines recommended for issuing a green bond. For more information, see ICMA’s Suggested Impact Reporting Metrics.
- Climate Bonds Principles

Energy Performance Certificates (EPCs)

An Energy Performance Certificate (EPC) is essentially an assessment of the energy performance of a building, where an A rating is very efficient and G inefficient; they can also include tips on the most cost-effective way to improve the energy efficiency of a building (Carbon Trust, 2021). In most geographies where they’re used, they are usually required to be displayed at the entrance of non-domestic buildings. In

most jurisdictions, they're also a requirement when building ownership is transferred. In most instances, they are valid for 5 or 10 years (Carbon Trust, 2021). In most countries, EPCs play in an important secondary role in providing the ability to map the building stock energy efficiency at a national scale; to monitor the impact of building policies and to support the introduction of new minimum energy efficiency requirements within the regulatory process, and to help enable robust carbon reporting and target setting in relation to the buildings sector (Carbon Trust, 2021).

EPCs provide performance information. EPCs provide estimate ratings or measured rating through energy meter readings. South Africa's EPCs (SANS, 2014:3) are not required for residential buildings. They are not a modelled approach in South Africa, and are rather based on actual performance, in contrast to many international precedents. EPCs provide an indication of a building's relative energy performance (to the benchmarks in the building standard, SANS10400XA) and provide an Energy Use Intensity (EUI) number for buildings (kWh/m²). Net Zero alignment would mean building owners should first reduce the EUI as much as possible, before renewables and offsets. In the UK/EU there are benchmarks around where the EUI should get to be net zero certified. In South Africa, EUI defining the expected operational energy demand resulting from the construction performance of a building in kWh/m²/annum, is a minimum of 20% lower than the EUI stipulated in the latest version of SANS 10400-XA for the relevant occupancy class of the building. As such, the requirement would have been to obtain an EPC certificate and operate 20% lower (kWh/m²/annum) than the relevant occupancy class. Rather than require EPCs for ensuring energy performance meets the required 20% threshold, the process for the revision of the draft definition was then first to understand how existing certifications schemes within South Africa might be utilised to support verification.

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