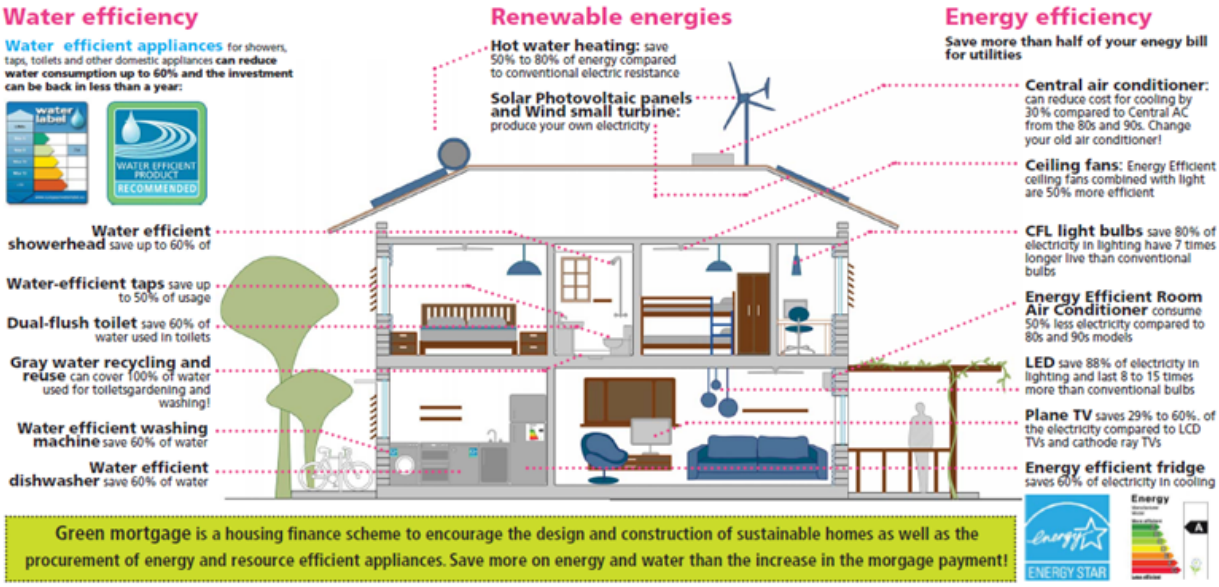
21

# Urban Energy Technical Note

# Sustainable Building Finance

## A Practical Guide to Project Financing in East Africa

**Figure 1: Green Building Principles in Practice**




Source: UN-Habitat, Sustainable Building in Tropical Countries

Finance has been identified among the most important barriers for the adoption of green building designs, and is the topic this guide seeks to address. The regional market presently does not provide adequate financial mechanisms and alternative lending products, i.e. green mortgages or preferential loans for sustainable, green and energy efficient buildings, and asset finance for integrated renewable energy networks. International experience with such products can inform how green property finance can develop in East Africa.

**A practical guide to project financing in East Africa** is based on the premise that green buildings typically carry higher upfront capital/buyer costs but lower ongoing/operational ones. As such, they offer financial value to lenders, owners, and occupiers; and societal value in reducing resource consumption, and carbon and other forms of pollution. Unlocking this value requires specialist energy efficiency, green building, and localised energy finance.

### Importance of Energy Efficiency and Green Buildings in East Africa

Energy used in commercial and residential buildings accounts for a significant percentage of total national energy consumption across East Africa. It is estimated that 40% of the total electricity generated in the region is used in buildings alone, consuming more energy than the transport and industry sectors.

Inefficient design and construction using inadequate materials for the climate, combined with poor understanding of thermal comfort, passive building principles and energy conscious behaviour, has led to tremendous energy wastage and high electricity bills. Improved building designs can create significant gains in energy performance and occupant comfort.

The significant building stock additions expected in East Africa in the coming decades make green design practices all the more critical, given the region's challenges in providing full access to modern energy services. High urbanisation rates and even higher projected rates of electricity demand are outpacing capacity additions to national energy generation and distribution networks. Addressing this challenge needs to consider both the energy and resource consumption within buildings, and also how buildings are supplied

with energy. Utilising low-carbon, on-site/local-area energy solutions that are affordable, installed and commissioned quickly, and scalable, can help address this demand growth and capacity constraint dilemma while accelerating the needed change toward renewable energy supply.

## The Importance of Green Finance

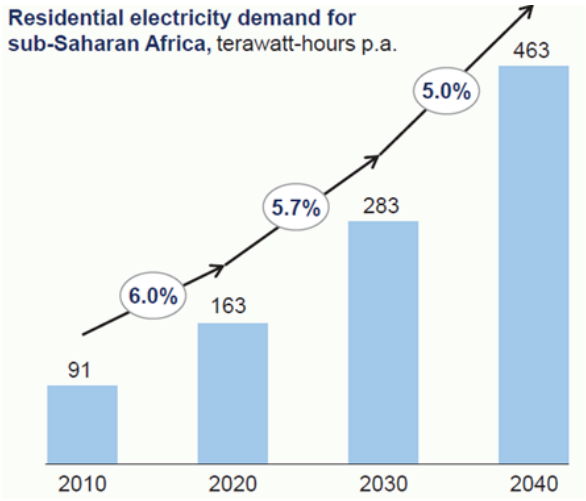
Achieving the internationally agreed targets of the Paris Climate Accord and the Sustainable Development Goals requires a vast mobilisation of both public and private finance, some US$90 trillion over the next 15 years globally[1]. Meeting the Sustainable Development Goals by 2030 presents a US$2.5 trillion global investment requirement in cities per annum[2].

While at an early stage, there is a discernible trend across the continent and globally for shaping finance practices to sustainability objectives. East African banks and other investment sector participants should actively take part in this. Doing so can seed green building and localised energy finance practices in the region, positively shaping the built environment for generations to come.

There are many barriers which prevent greater investment in green buildings and energy efficiency. They include higher costs; information asymmetries; performance data and validation; and the principal/agent problem. The characteristics of the East African property finance market - i.e., its high interest rates/cost of debt; housing affordability constraints from a mismatch between income levels and the production cost of formal housing; and low liquidity from shallow capital markets and modest amount of refinance products and activity in each country – add to these investment barriers. Any green finance products created will need to be tailored to these local conditions. Figure 3 summarises these barriers and potential finance instruments to address them.

While there are reasonable concerns that green buildings will be more costly to deliver and thus impact upfront affordability, the available evidence suggests only modest cost premiums to design and build green are needed. Meanwhile, the evidence base that green buildings create financial benefits in excess of costs is solid and growing.

**Figure 2: Residential Electricity Demand for sub-Saharan Africa (TWh/Annum)**




Source: McKinsey and Company (2015). Brighter Africa: The growth potential of the sub-Saharan electricity sector

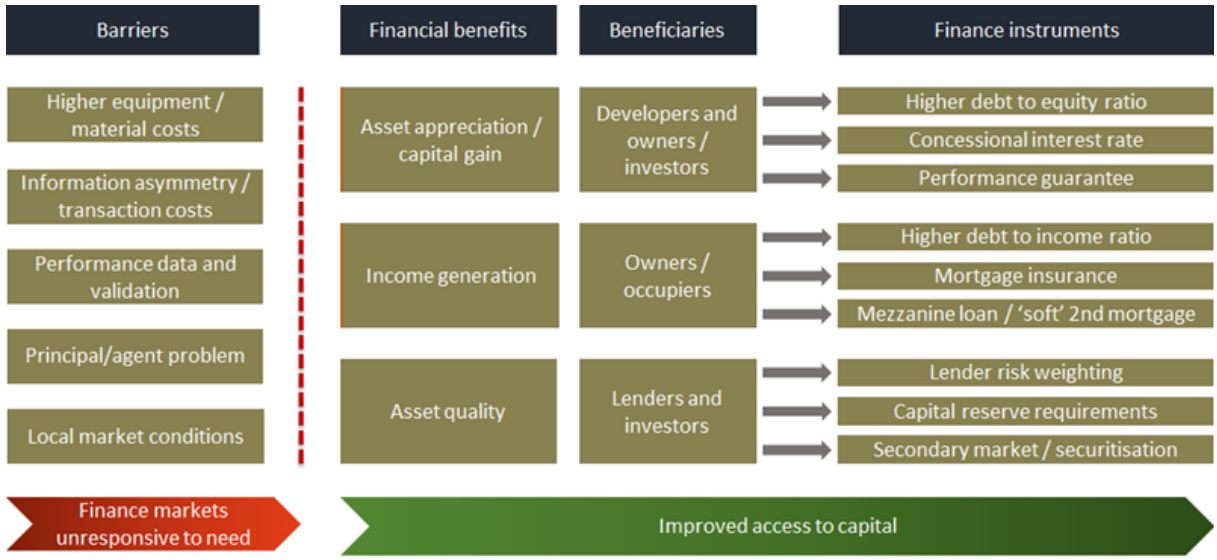
## Recommendation: Green Concessional Construction Finance

That green properties return higher values vis-à-vis comparable properties in the marketplace, and improve occupant/owner cashflow and satisfaction, they reduce both the likelihood of borrower default and the potential that foreclosed properties are liquidated at values below their debt liability. This is particularly relevant in the absence of a secondary market as primary lenders remain the long-term holder of the loan and security. These characteristics of green buildings shown in markets

[1] UNEP (2016). Financing Sustainable Development: Moving from Momentum to Transformation in a Time of Turmoil. United Nations Environment Programme Finance Initiative / Inquiry into the Design of a Sustainable Financial System.

[2] Business and Sustainable Development Commission (2016). Valuing the SDG Prize in Cities

**Figure 3: Barriers and Potential Finance Instruments greater investment in green buildings and energy efficiency**



internationally can support the region's banking sector in evaluating how modest adjustments to lending criteria and practices can result in more credit flows to green buildings.

As a first step, it is recommended that a **green construction loan product** be developed whereby project debt is provided at concessional interest rates in order to balance out any increase in project capex compared to non-green buildings. The end-result should be that the price borne by the end-buyer is equal or very close to that of comparable non-green properties in the market.

Figure 4 outlines a process for bringing a green construction finance product to market. Equalising the cost of construction between green and standard properties will start to build the supply of green properties; create producer and consumer understanding and demand for green properties; and build the evidence base on green building benefits.

Having objective design and in-use assessment and performance data is foundational to making investment and lending decisions in green buildings. Fortunately, there are a range of existing tools in use internationally – many in development contexts similar to the EEBEA target countries – that can be applied here to support finance decisions. An objective of any green finance initiative should be to deepen the pool of data and performance indicators on energy performance and other green building attributes. Though not a comprehensive list, the best practice and knowledge resources listed in Table 1 may be drawn upon to develop this finance mechanism.

## Recommendation: Localised Energy Asset Development and Finance

Integrating distributed energy systems within large master planned property projects can take advantage of remarkable cost reductions in renewable energy, storage, and demand management. Local area microgrids (Figure 5) can provide owner/occupier benefits through secure, lower-cost energy, and deliver wider network benefits. Yet uptake of integrated localised energy systems has been low.

The property finance and delivery sectors tend to be risk-averse toward new technologies and changes to tested design, financing, and construction pathways. A strategy to help overcome this aversion is for the property and the energy assets to be separated into parallel development tracks tied via power purchase and lease agreements. Localised energy delivery thus gets vested with specialists who bring their own expertise and financing to the project, allowing the lead property developer to focus solely on its core asset. For projects targeting lower-income buyers/residents, this may offer tangible development cost saving and affordability benefits as expenditure on site infrastructure is capitalised through a partner's long-term energy asset financing, rather than the lead developer's short-term construction debt.

Figure 6 highlights a process to assess the commercial viability for localised energy systems (potentially bundled with other local utility services, e.g. water, wastewater, and data) within large-scale development plans. The emphasis is on whole networks rather than individual elements, i.e., rooftop solar panels on individual buildings. If only the latter is pursued, it could be done within a concessional construction loan as described above, with the property developer taking on delivery risk and recapturing the investment at the point of sale. Alternatively, the systems approach is premised on creating a separate local energy/utility asset that can be financed and delivered by a dedicated delivery partner. Doing so could create affordability gains, value uplift, resource and carbon savings, and wider network benefits greater than could be achieved on an individual elements basis.

For the East African market, the availability of finance resources, the economic return to the lead property developer, and the availability of delivery and operations partners for splitting the energy and property assets, needs to be assessed. The aim is to justify to property developers/investors that localised energy asset finance and delivery is market-ready, the financial benefits for lead project sponsors can be realised, and that delivery and operations risks can be managed. This may require support from specialised capital and project preparation finance sources at the outset. Some best practice and knowledge resources which may be drawn upon to deliver this finance mechanism are provided in Table 2 on the next page.

**Figure 4: Process for Bringing Green Construction Finance Product to Market**

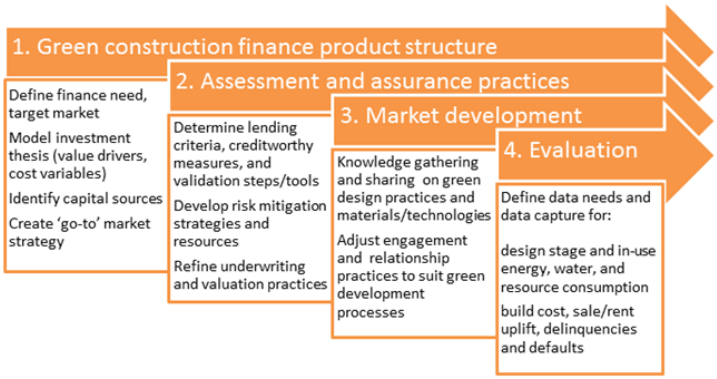
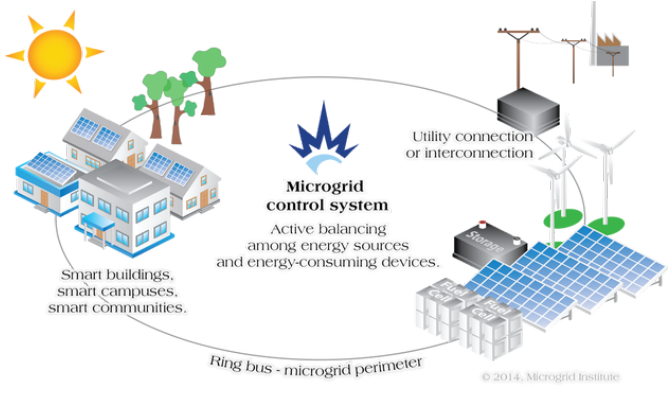
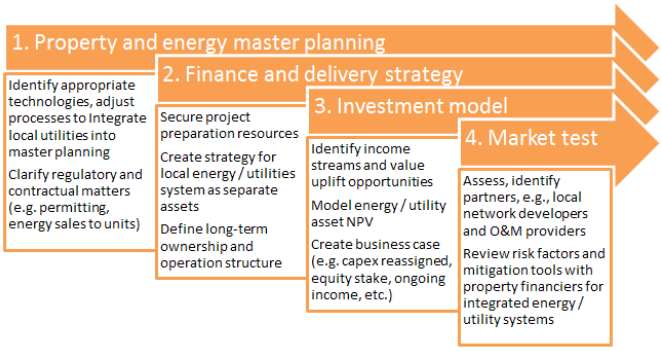



**Figure 5: Local Area Microgrid Schematic**



## Figure 6: Process for Assessing the Commercial Viability for Localised Energy Systems




## Table 1: Best Practice and Knowledge Resources for Green Buildings

| Product & Market Development Activities | Resources |
|---|---|
| 1. Green construction finance product structure | • International green mortgage products (e.g., Mexico, South Africa, India, United States, etc.)<br>• IFIs and national institutional investors<br>• Green bond market |
| 2. Assessment and assurance practices | • Green building tools (e.g., EDGE)<br>• Performance guarantees and mortgage insurance (e.g., Brazil, Canada)<br>• RICS (UK), Appraisal Institute (US) and RenoValue, ReValue (EU) green valuation checklists and knowledge tools |
| 3. Market development | • EEBEA technical guidance documents and knowledge resources<br>• National green building councils |
| 4. Evaluation | • International energy and water audit protocols and post-occupancy evaluation methods<br>• Loan and property performance tracking (e.g., Community Preservation Corporation and Enterprise – US, EU Energy Efficiency Re-finance pilot) |

## Table 2: Best Practice and Knowledge Resources for Green Buildings

| Product & market development activities | Resources |
|---|---|
| 1. Property and energy master planning | • Technology and regulatory framework reviews (e.g., IRENA, REN 21, World Bank RISE 2016 )<br>• EEBEA technical guidance documents and knowledge resources<br>• International case studies (Europe, US, Japan) |
| 2. Finance and delivery strategy | • Project preparation grants from IFIs or donors (e.g., Sustainable Energy for Africa, Renewable Energy Performance Platform/REPP, Green MiniGrid Facility) |
| 3. Investment model | • National or regional examples of rural or industrial/large commercial energy generation systems and microgrids |
| 4. Market tests | • National or regional renewable energy councils or industry associations<br>• Specialist equity funds<br>• Risk mitigation instruments (e.g., currency hedge, performance guarantees) |

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