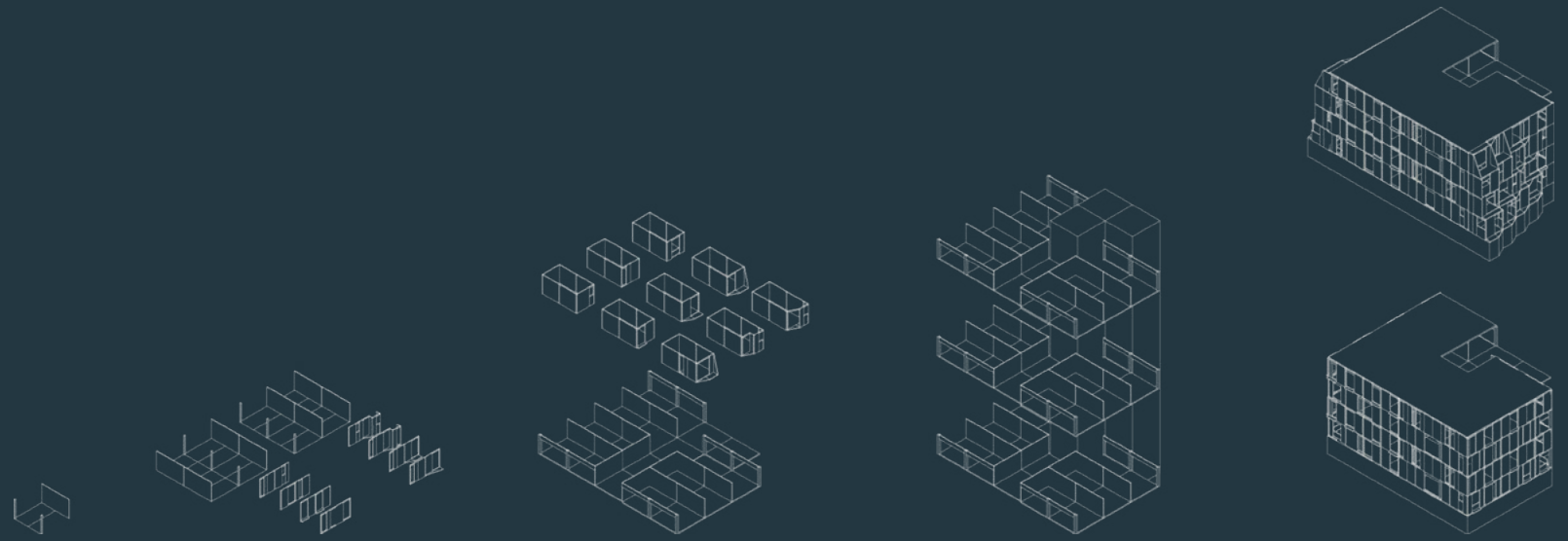
BUILDX LT

FOREST TO FRAME

How building with wood can transform our carbon footprint.



GATSBY AFRICA

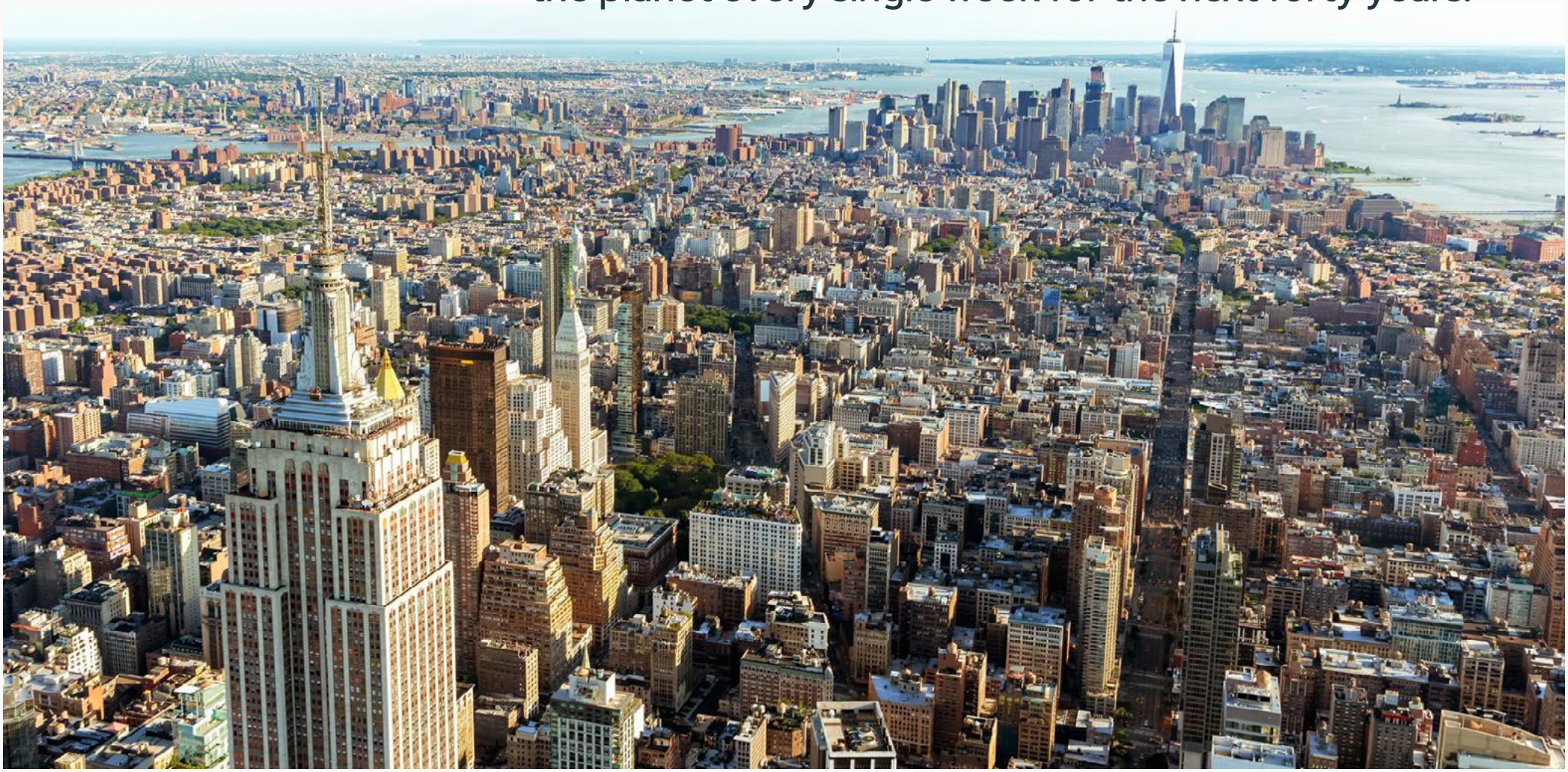
STICHTING DOEN

AUTODESK FOUNDATION

MULAGO

Climate Smart Forest Economy Program

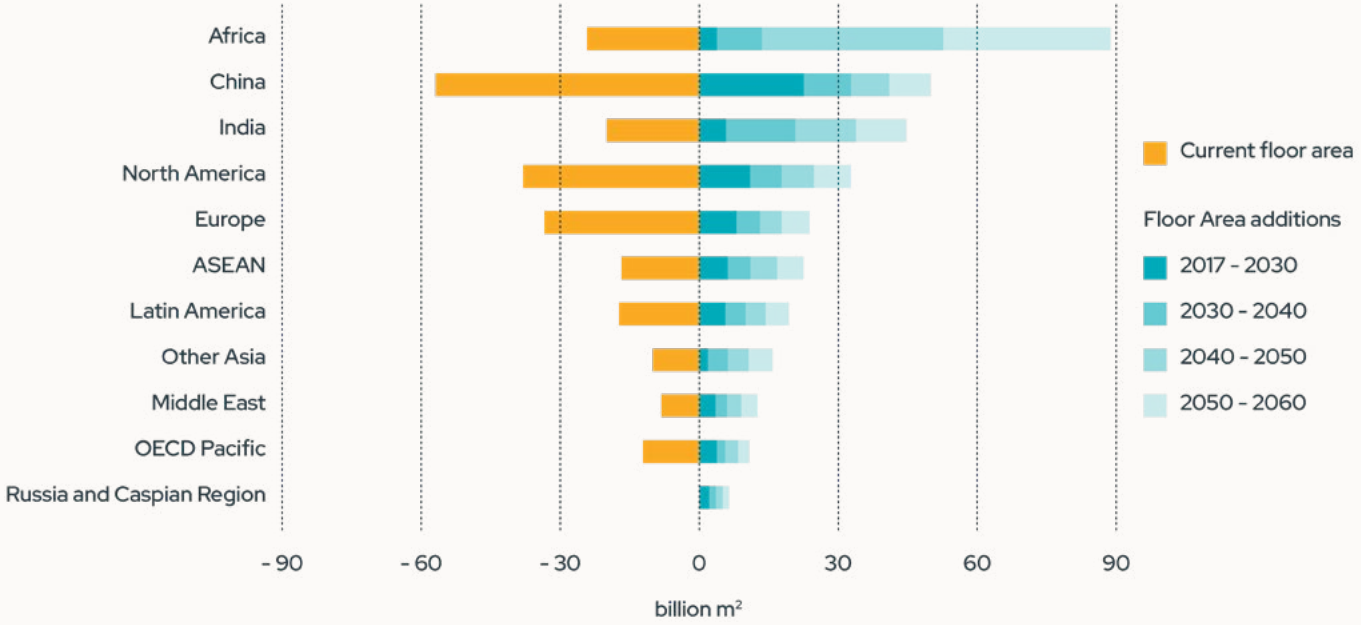
Our population is growing rapidly, driving such high demand for new buildings that we will add the equivalent of an entire Paris, or New York City, in new construction to the planet every single week for the next forty years.



A GROWING CONTINENT

Over the next 40 years, ~35% of all new construction will occur on the African continent, where embodied carbon is forecast to exceed operating emissions.

Floor area additions to 2060 by key regions:



Notes: OECD Pacific includes Australia, New Zealand, Japan and Korea
Source: IEA (2017), Energy Technology Perspectives 2017, IEA/OECD, Paris, www.iea.org/etp


Buildings and construction account for 39% of global carbon emissions, more than any other industry.


Most cities are made from concrete and steel, which
together account for 8% of global carbon emissions.

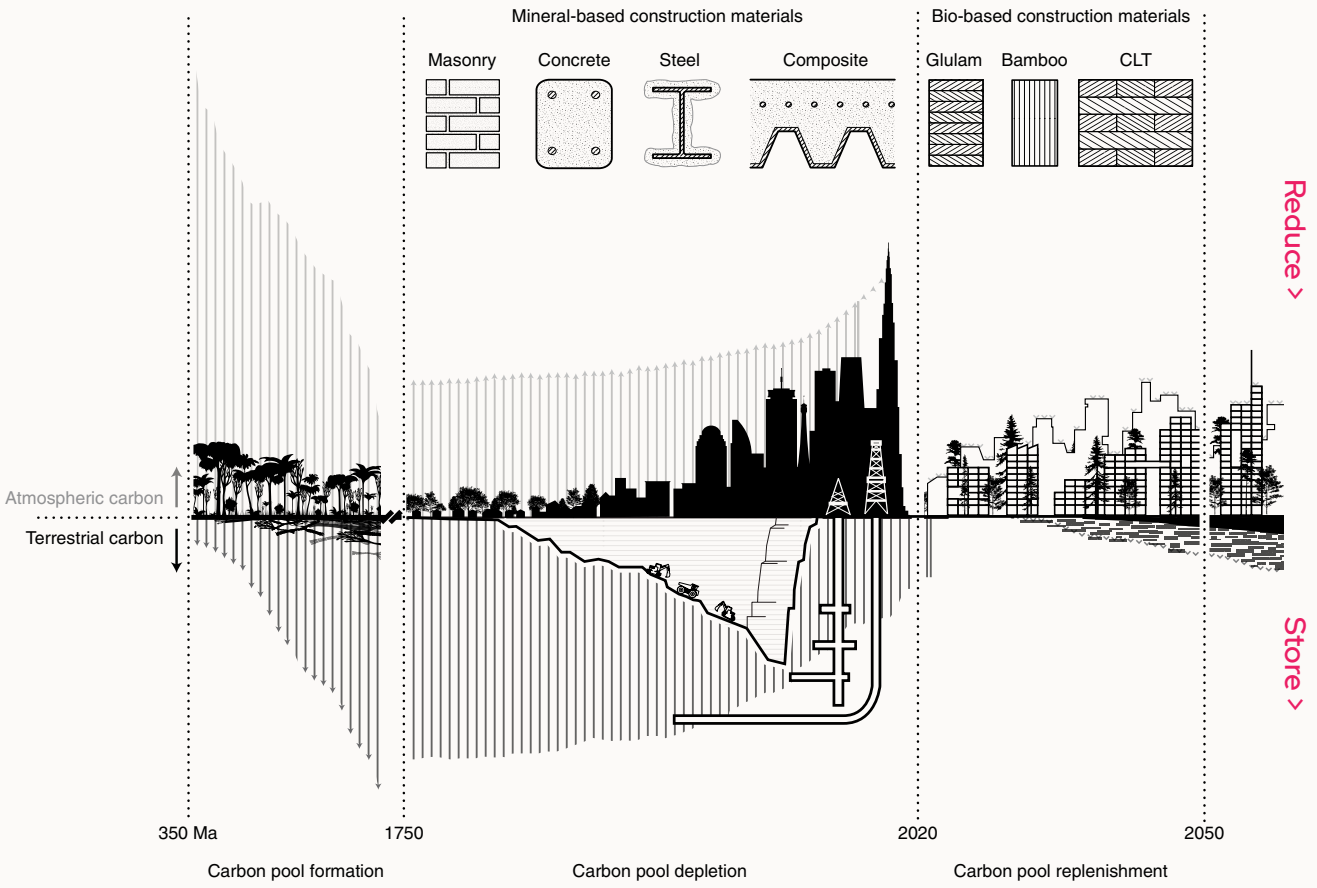
SOLUTION

The materials we use to build must move away from mineral-based, finite materials towards bio-based, renewable materials.

Reuse
Only build new where essential
(e.g. conversion/renovation of old buildings)

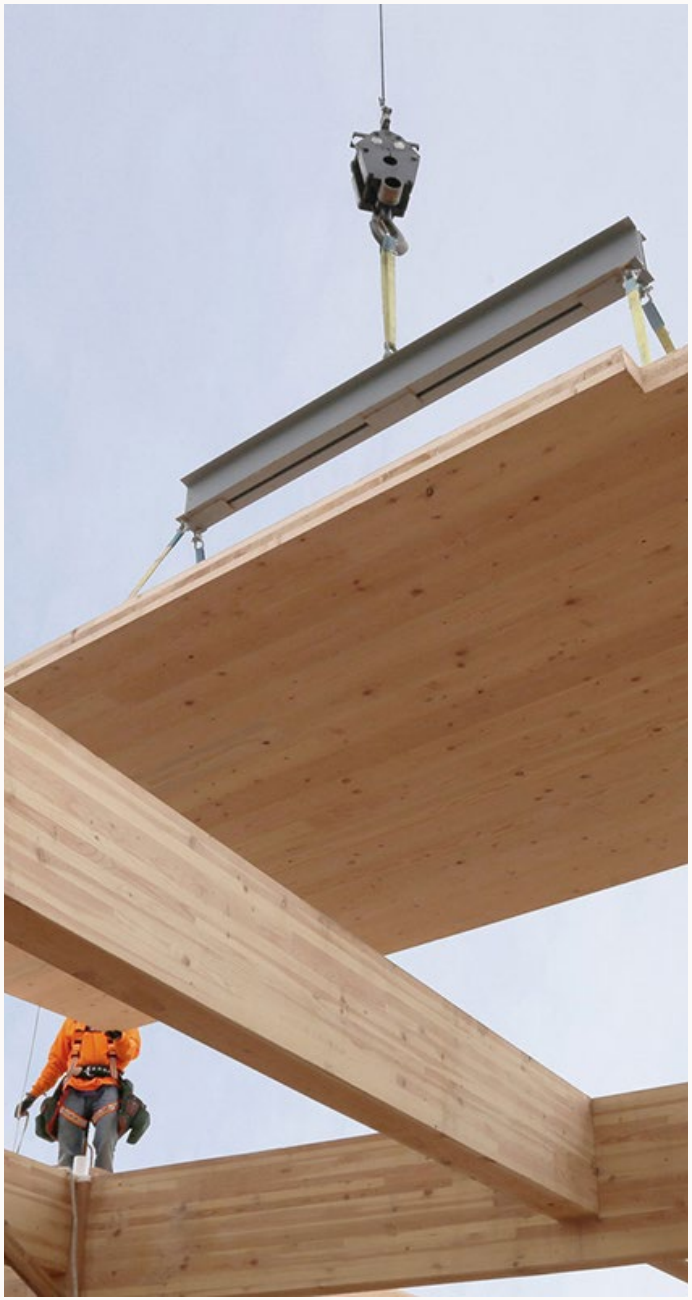
Reduce
More design, less material
(e.g. prefabrication, efficient structures)

Replace
Change the actual materials we use to build
(e.g. use bio-based materials)



Sink

The Forest



Store

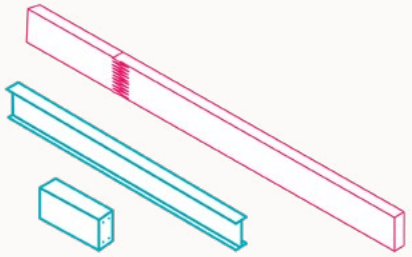
Manufacturing & Processing

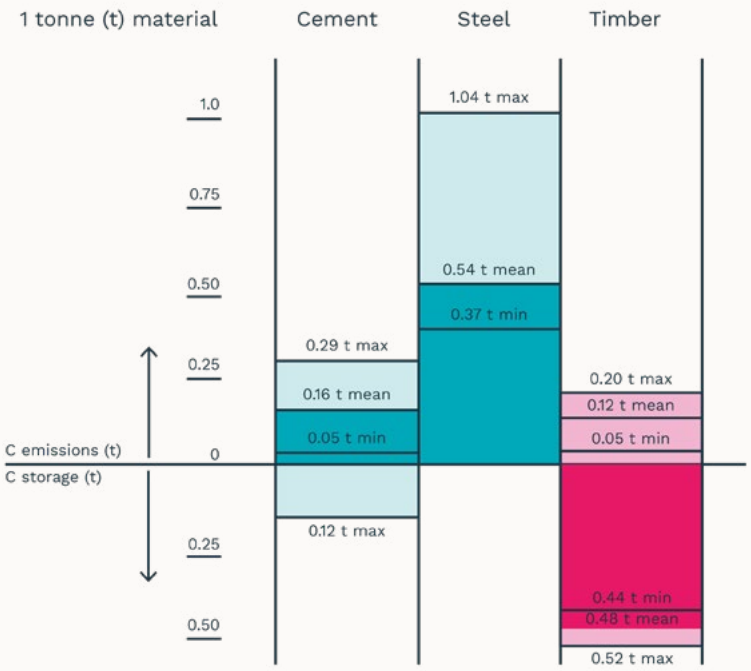
Substitute

Buildings

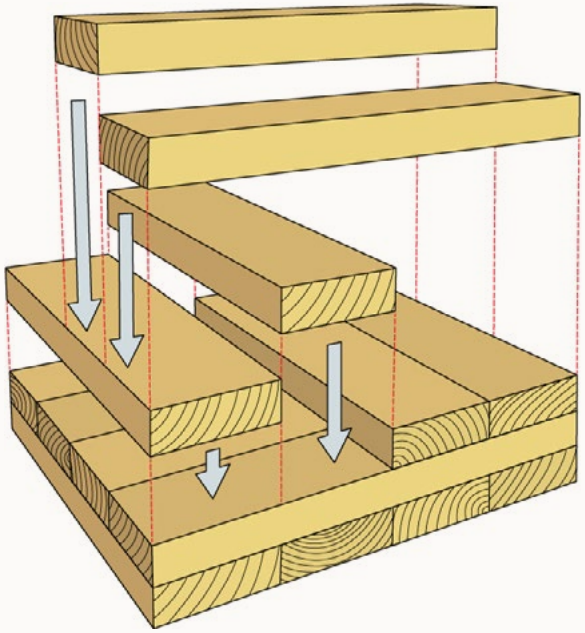
CARBON

1 m^3 of wood stores 1 tonne of CO_2 meaning that if we made 90% of all new buildings from wood, we could cut global CO_2 emissions by 4% - more than the carbon footprint of flying.





MASS TIMBER

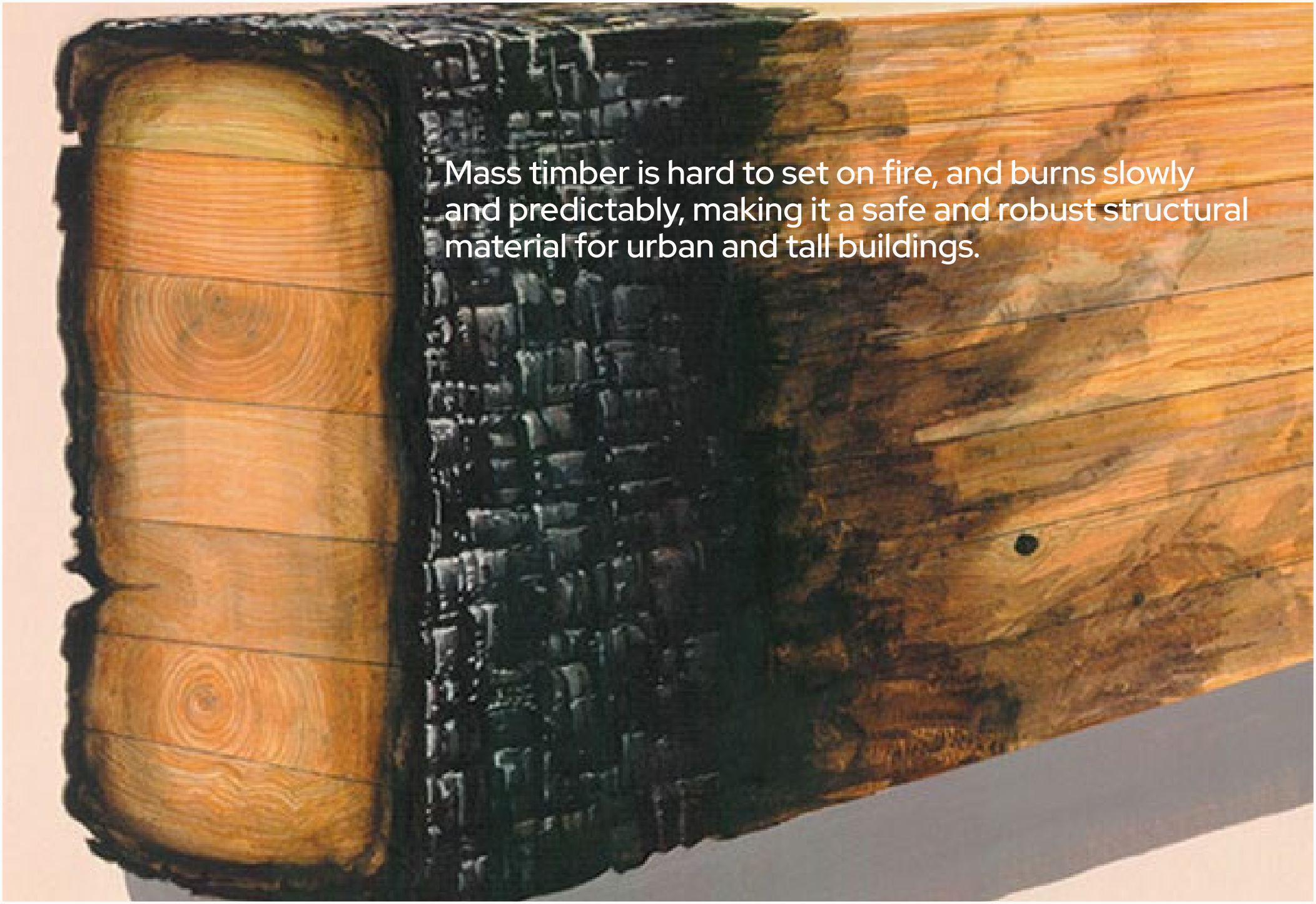


Mass timber is a recent innovation in wood products comprised of multiple solid wood pieces bonded together to create larger panels of exceptional strength.

Types of Mass Timber

Global Growth

Future Outlook


Mass timber is hard to set on fire, and burns slowly
and predictably, making it a safe and robust structural
material for urban and tall buildings.

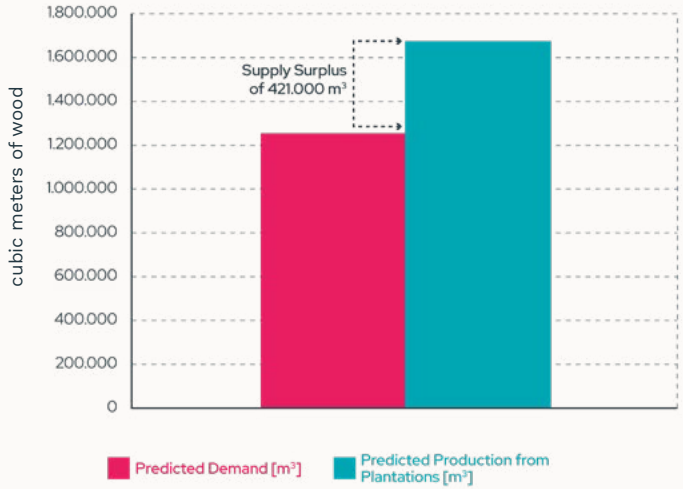

We need to create higher value for farm forests to encourage more people to plant trees and reduce the pressures that lead to deforestation of natural forests.

SUPPLY & DEMAND

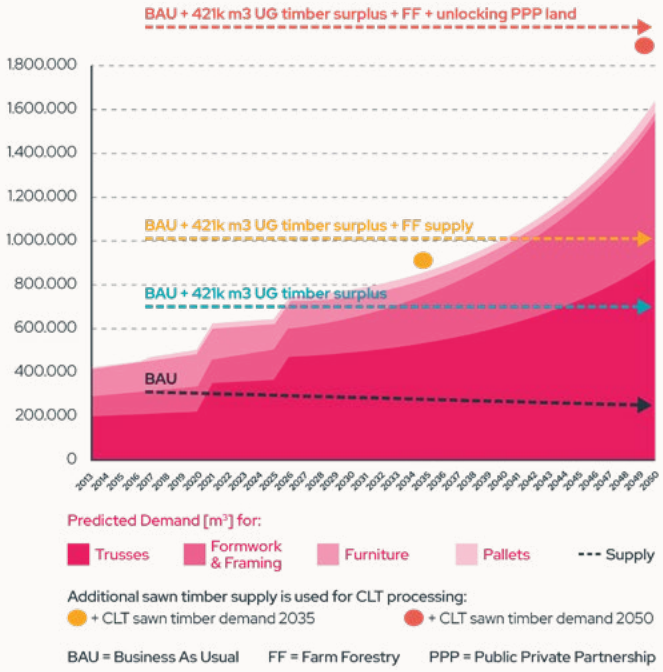
Raw material supply must be planned at a regional level, with forest stocks and primary processing capabilities variable across East Africa.

Supply & Demand of Sustainable Timber

Uganda Surplus by 2030



Kenya + Uganda Supply vs. Kenya Demand (excl. CLT)

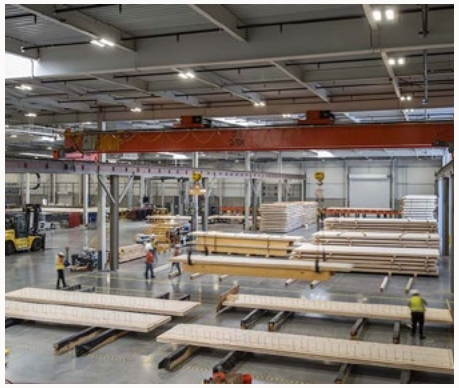


Source: Gatsby Africa

BENEFITS

Mass timber is an innovative new building material, superior to concrete and steel in many ways and a highly promising climate change solution.

80% Lighter



20% -70% Faster

Thermal Efficiency

Greater Strength

Health Benefits

The 50m^2 prototype structure took a mere 20 hours to construct

From the outside, the CLT can be seen alongside a thin stone exterior cladding

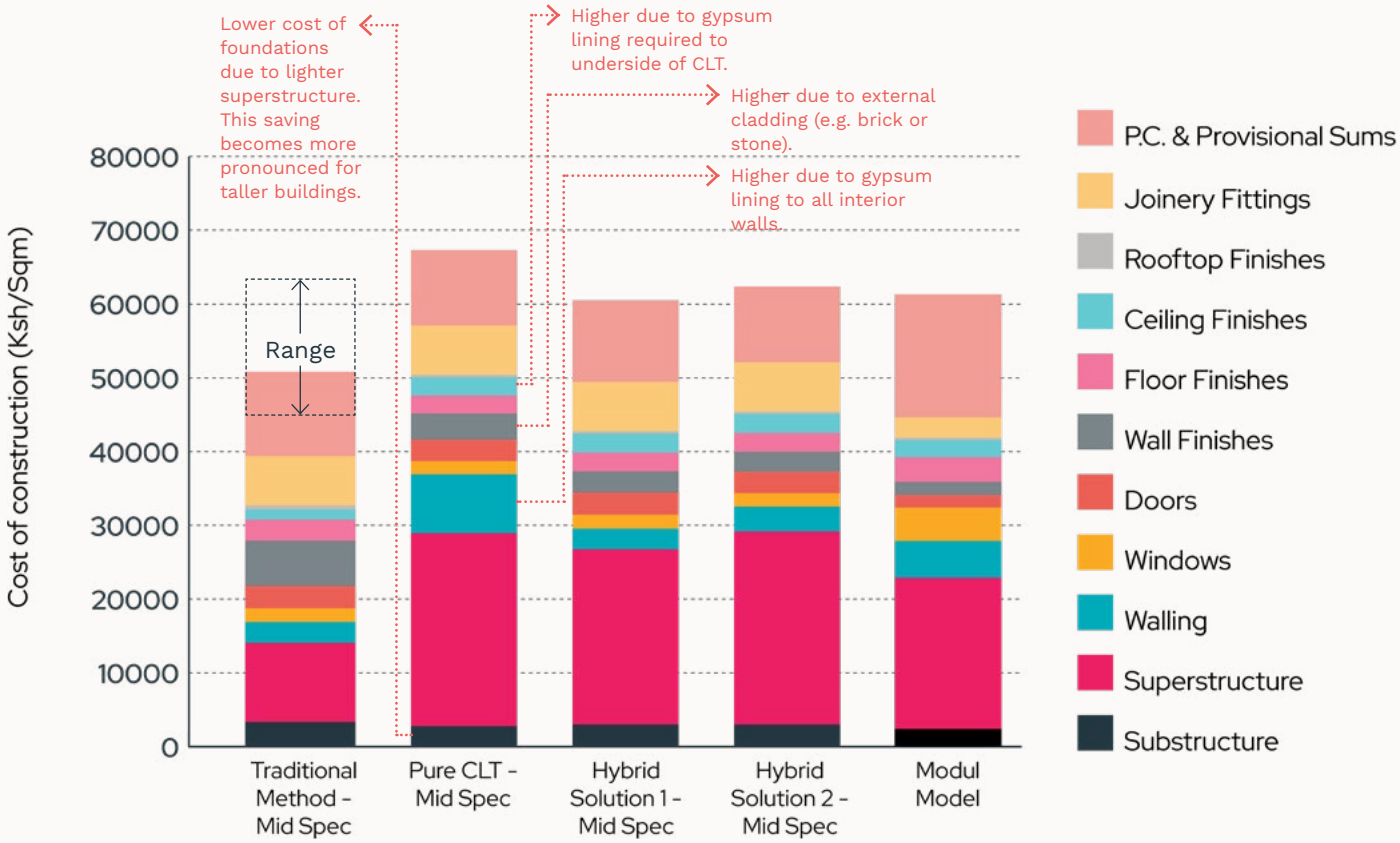
Part of the interior is fitted out like a real apartment

BUILD COST

Mid Spec

As a new product on the market, full CLT construction will cost a premium compared with traditional methods. With growth this superstructure cost will decrease significantly.

Hybrid solutions, which merge CLT elements with traditional methods can lower initial costs whilst gradually introducing the product to market.



Notes:

Pricing is based on a case study of a 13-storey medium spec residential apartment building in Nairobi.

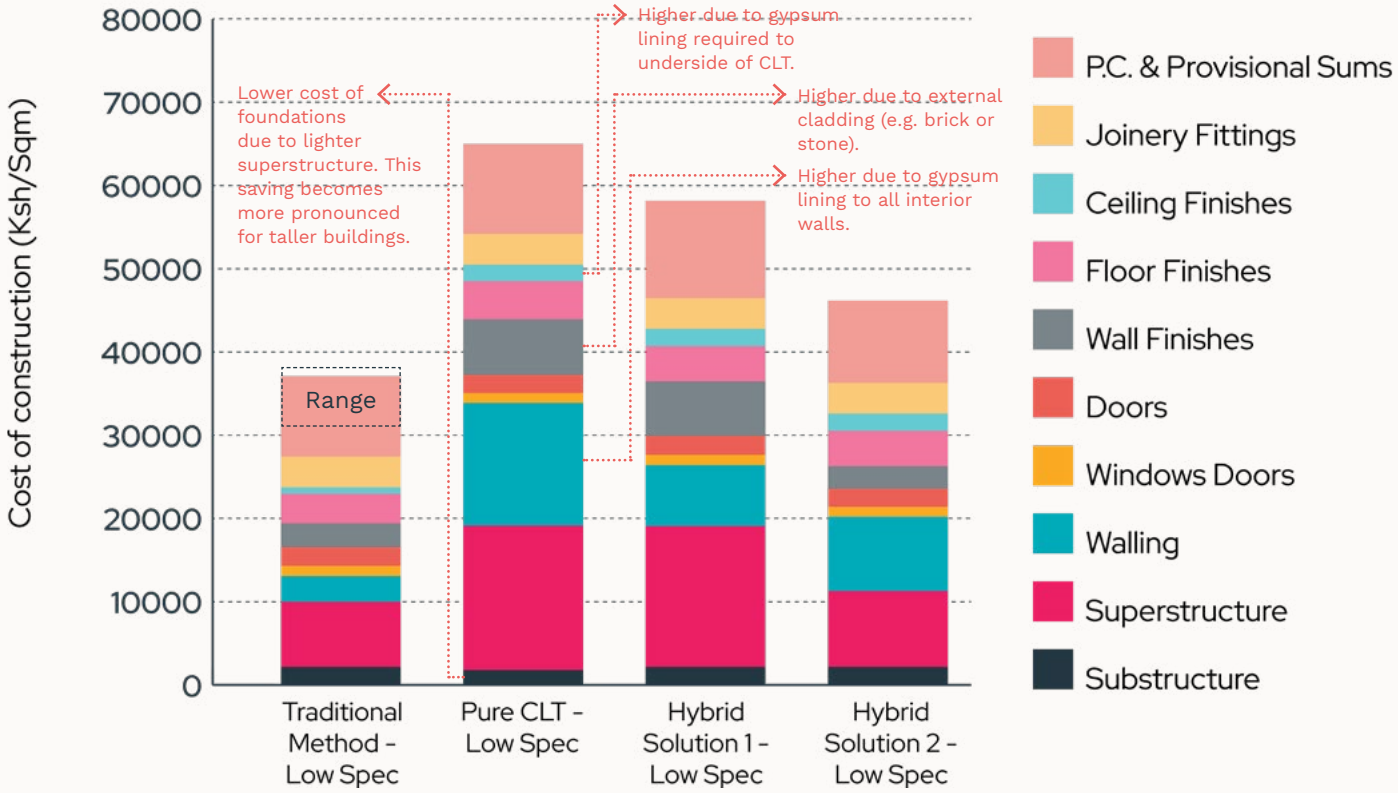
- 'Traditional Method' assumes a steel-reinforced concrete (RC) frame, RC floor slabs, and local quarry stone infill walling.
- 'Pure CLT' assumes a full CLT superstructure (e.g. for all walls, floors, etc).
- 'Hybrid Solution 1' assumes a RC and masonry ground floor, RC stair core, and CLT walls and floors for upper storeys.
- 'Hybrid Solution 2' assumes a RC frame with masonry infill, and CLT floors.
- 'MODUL' is BuildX's full CLT urban housing system and shows the potential to reduce a pure CLT structure with effective value engineering.

BUILD COST

Low Spec

Building using locally-made CLT panels can be competitive with the mid and upper market early-on, whilst serving the affordable market will require scale.

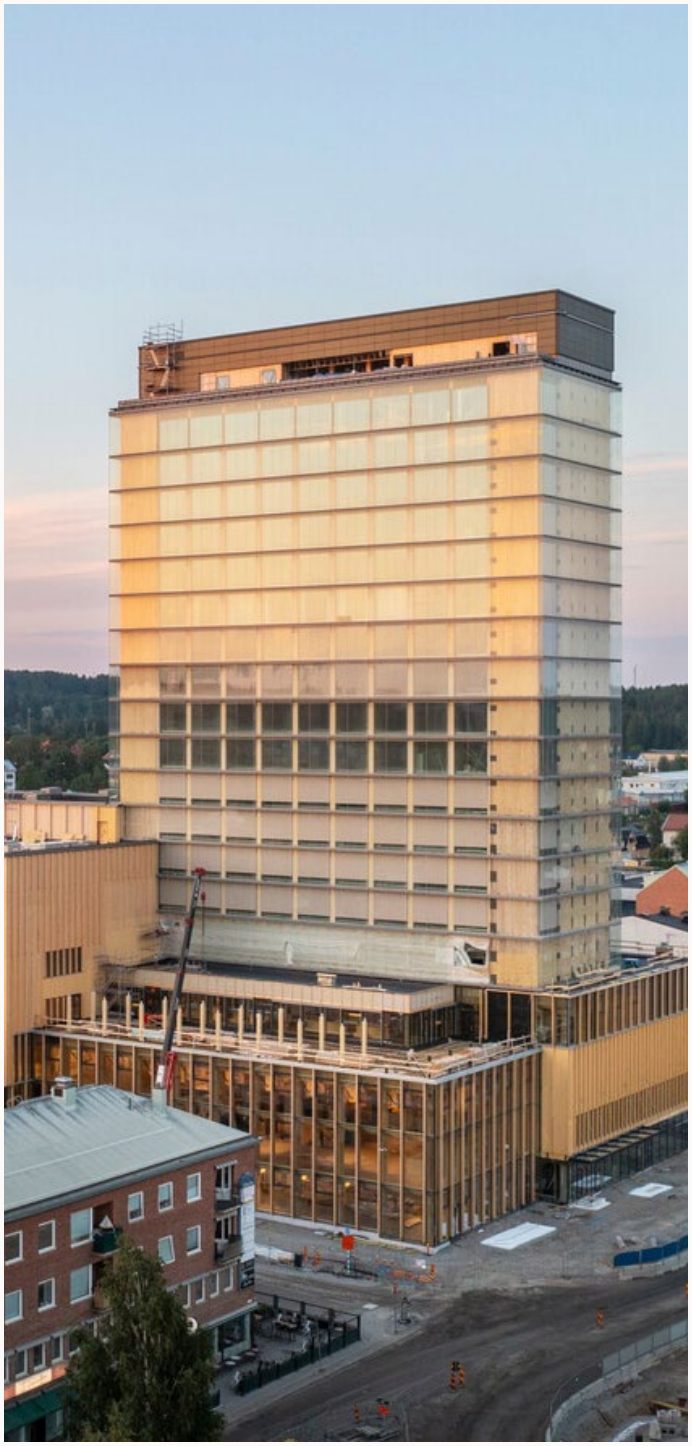
There are a number of cost savings which can be realised over time to help reduce the cost of CLT to compete in the lower-end affordable market.



Notes:

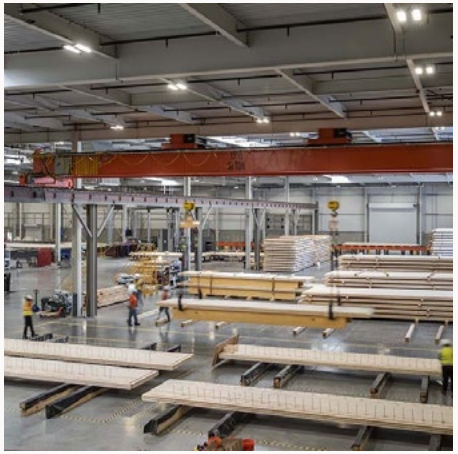
Pricing is based on a case study of a 4-storey low spec residential apartment building in Nairobi.

- 'Traditional Method' assumes a steel-reinforced concrete (RC) frame, RC floor slabs, and local quarry stone infill walling.
- 'Pure CLT' assumes a full CLT superstructure (e.g. for all walls, floors, etc).
- 'Hybrid Solution 1' assumes a RC and masonry ground floor, RC stair core, and CLT walls and floors for upper storeys.
- 'Hybrid Solution 2' assumes a RC frame with masonry infill, and CLT floors.



STRATEGY

A coordinated full value chain approach - from forest to building - will be required in order to transform the market and create an enabling environment for wood buildings.



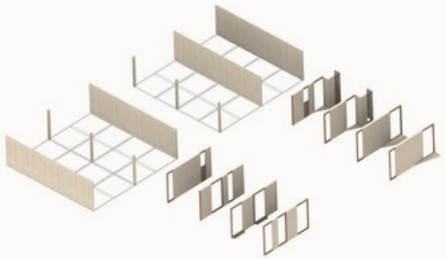
	Coordinate Forestry	Establish CLT Factory	Develop CLT Buildings	Enable Public Environment
Short Term	Ugandan Plantations	Imported CLT (South Africa)	Prototype & BuildX Projects	Political Buy-In
Mid-Long Term	Kenyan Plantations	In-Country CLT Processing	Green Building Market Demand	Major Policy Changes
Opportunity	Smallholder Farm Forestry	Export Markets	Affordable Housing Program	Align to Kenya Climate Goals

MODUL

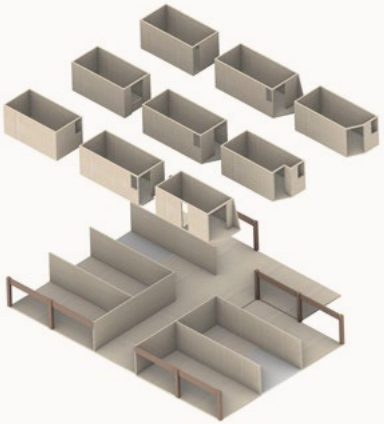
Residential Project

We are developing a flat-pack CLT urban housing concept with options for both affordable and middle-income developments as a high volume market solution.

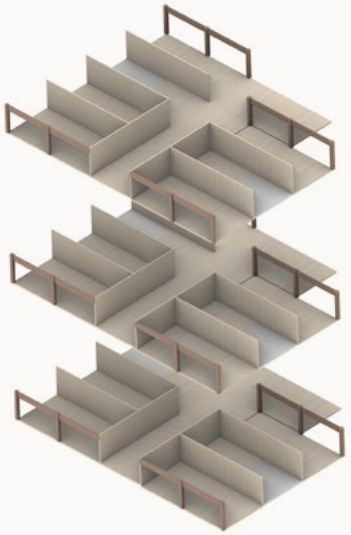
CLT Panel



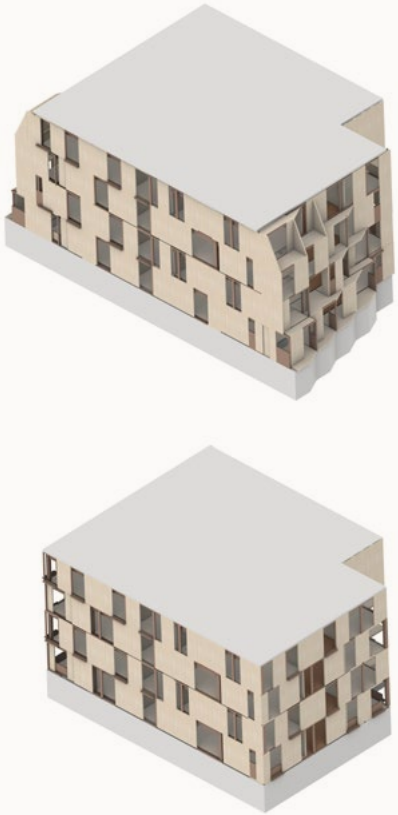
Assembly



Modules



Apartments



Buildings

MODUL means **MO**del for **D**ecarbonised **U**rban **L**iving

BUILDX

THANK YOU

James Mitchell

Co-Founder & CEO

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Companies To Inspire Africa 2019

Design for Health & Wellness 2019

Aspen Spotlight Health Awardee 2018

Shortlisted 2018

Curry Stone Honoree 2017

GSBI & AMP Alumni 2016 & 2020

Our sister-organisation:

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