维科来

VIKARA SHENZHEN

Whitepaper

Innovative Modular Construction VikaraPolyCube in the Context of the People's Republic of China's 15th Five-Year Plan (2026–2030)

Working and Living in Harmony with Nature

This document presents the revolutionary modular building system of Vikara Shenzhen Ltd., featuring technological innovation, sustainability, a circular economy and a new living and working concept including intelligent control and management.

2026

Contents

Innovative Modular Construction

VikaraPolyCube in the Context of the People's Republic of China's 15th Five-Year Plan (2026–2030) — Working and Living in Harmony with Nature

This whitepaper introduces VikaraPolyCube — a modular high-rise system deliberately aligned with China's national development priorities for 2026–2030: urbanization, green industry, AI integration and infrastructure modernization.

Urbanization

Green Industry

AI Integration

Infrastructure Modernization

Decision-Relevant Metrics at a Glance

Metrics that matter for every decision.

-10%

Lower construction costs compared to the local market value

>50%

Shorter construction time through industrial prefabrication

>80%

Sustainable building materials — share of recyclable materials

Factor 2

Green space compensation factor

Net Zero

CO_2 footprint during the operational phase

Company Profile and Approach

Vikara Shenzhen Ltd. has developed a revolutionary modular unit system for high-rise buildings that enables intelligent control and management across all areas through technological innovation, sustainable development, a circular economy and new living concepts.

The unit combines industrial prefabrication with advanced technology, using AI, novel materials, biocomposite materials and photovoltaics for precise building control.

The AI-based system learns from residents' behaviour and continuously optimizes itself to achieve climate neutrality without placing additional strain on the environment.

End Goal

Creating living and commercial spaces for the benefit of people

Implementation path: the integration of technology, industrialization and sustainability

1. Industrial Prefabrication

Production to the highest standards

2. Efficient Transport

Optimized logistics for simple, fast assembly

3. Fast Assembly

Rapid completion at the chosen site

4. AI Control

The system dynamically adapts to residents' needs and environmental conditions and continuously learns

5. Sustainable Operation

Lasting efficiency through renewable energy and intelligent control

Company Overview

Key information about our organization, our capabilities and our global orientation.

Company	Vikara Shenzhen Ltd.
Founders	Markus Haubensak · Jack Halank · Nick D'Agostino
R&D Center	Shenzhen, Guangdong Province, People's Republic of China — research & development only
Technology	Industrial Prefabrication · Artificial Intelligence · Biocomposite Materials · Photovoltaics
Investment Required	RMB 15 million (first funding round completed)
Target Regions	Belt and Road · ASEAN · Middle East · Africa · Europe · South America

Circular Economy Manifesto

We choose to work with nature rather than against it. Our innovation is driven by a clear purpose, and our thinking revolves around sustainability.
We build resilient, responsible communities. Every decision matters. Every cycle is crucial.

01

Bio-Based Materials

The use of bio-based materials in construction reduces CO_2 emissions. Lower emissions have a positive impact on the environment.

02

Natural Resources

Vikara Shenzhen relies on carefully selected natural, environmentally friendly materials such as hemp, wood, glass, sugarcane, sunflower, natural stone and coconut. We are committed to renewable materials and sustainable, responsible development.

03

Sustainable Operation

Energy and water supply are managed intelligently and in harmony with nature — for efficient and responsible resource consumption.

04

Designed for the Entire Life Cycle

Tailor-made living spaces that accompany every stage of life. Flexible spaces for a better life — consistent and reliable. The architectural concept covers the planning and construction of industrial, commercial and residential buildings as well as the adaptive redesign of existing structures to meet changing spatial needs throughout life.

The 15th Five-Year Plan and Vikara Shenzhen Ltd.

The 15th Five-Year Plan of the People's Republic of China (2026–2030) sets clear priorities: compact urban development, green industry, AI integration, and the modernization of construction and infrastructure. As a leading innovation hub, Shenzhen plays a strategically significant role in this national development process.

With its AI-driven modular building system, Vikara Shenzhen Ltd. directly addresses the plan's six core priorities — from residential and commercial development to energy efficiency in construction and industrial standardization. The company does not see itself as a traditional real estate developer, but positions itself strategically at the heart of China's state-led development agenda.

Core Priorities of the 15th Five-Year Plan

Compact Urban Development

Promoting compact, liveable development models for sustainable urban districts.

Green Industry

Promoting the green economy and creating sustainable value in the economy and industry.

AI Integration

Innovation and intelligent growth are driven by artificial intelligence.

Modernization of Infrastructure and Industry

Modernizing infrastructure to promote technical progress and higher quality standards.

Shenzhen: Innovation Hub

Strengthening technological and innovative capacity to increase nationwide impact.

The Six Core Areas of Vikara Shenzhen Ltd.

1. Residential and Commercial Space

Modular construction for energy-efficient, high-density living spaces.

2. Industrialization of Construction

Standardized construction processes for greater efficiency and quality across the board.

3. AI Integration

AI technology supports the entire process from planning and design to production and management.

4. Energy Efficiency

Sustainable construction with green materials reduces energy consumption and CO_2 emissions.

5. Industry Standardization

The modular system fully complies with national standards and ensures safety.

6. Future-Ready Infrastructure

Advanced expansion technologies ensure safe and resilient strategic infrastructure.

Concrete Implementation Aligned with the Relevant Chapters of China's Development Plan

We implement China's development plan through concrete action

Chapter	Topic	Vikara in Action
Chapter 4	Construction and New Materials	Prefabrication: industrial prefabrication of bio-based materials, VikaraPolyCube system
Chapter 31	71% urbanization rate by 2030	Contribution to the optimal progress toward the stated targets
Chapter 7	Modern Infrastructure	Photovoltaics, water cycle, shared mobility
Chapter 13	AI-Plus Strategy	AI integration optimizes energy, water, space and mobility management
Chapter 44	Real Estate Market Development	Flexible rental models and new forms of ownership
Chapter 50	Sustainable Production and Lifestyle	Surface factor 2+, zero waste, net-zero emissions

Technology Focus — VikaraPolyCube Modular Prefabrication System

Vikara's construction method is based on a proven principle from the automotive industry: all volumetric modules are fully manufactured in the factory rather than on an uncontrolled construction site. This concept — Modular Volumetric Construction (MVC) — significantly reduces material waste, shortens construction time and lowers building weight compared to conventional concrete construction. Each module is based on a limited number of standardized types that can be flexibly combined.

Process Flow

1. Standardized Design

The modules are based on a few standardized types that can be flexibly combined in many ways.

2. Factory Production

The modules are produced in a controlled factory environment — for consistently high precision and quality.

3. Transport

The finished modules are transported to the site safely and efficiently and are ready for immediate use.

4. On-Site Assembly

The modules are assembled on site quickly and efficiently — saving time and labour.

Key Advantages

Less waste Shorter build time Lower weight Higher quality

The VikaraPolyCube Product

VikaraPolyCube — the system's core modular unit.

A fully prefabricated, greened and AI-enabled residential/commercial module

Designed for rapid deployment and long-term sustainability.

- Cylindrical, organically shaped module
- Vertical façade greening (moss, plants)
- Generous, transparent glass surfaces
- Modern wood panelling in the interior

Pre-series production of a VikaraPolyCube module in the factory environment — with vertical greening, generous glass surfaces and photovoltaic elements.

Collaborative assembly by industrial robots

Sustainability and Performance Comparison of Building Materials

Comparison Table: Conventional Brick/Concrete vs. Sugarcrete®

Metric	Conventional Brick/Concrete	Sugarcrete®
CO_2 Footprint	Very high (major climate factor)	**Up to 170 kg CO_2 saved per cubic metre**
Fire Protection	Fire protection class A1	**ISO 1716:2021, class A1 (highest rating)**
Weight and Composition	Solid but heavy	**Optimal balance of low weight and high thermal storage**
Compressive Strength	Standard compressive strength	**Tested to ASTM C39; suitable for load-bearing structures such as foundations and walls**

VikaraPolyCube — System Architecture on Four Levels

1

Micro Level

Fibres form the natural foundation of this system. Bio-based raw materials that were originally considered waste in the circular economy become the system's basic building block here.

2

Component Level

Saplam is a lightweight, high-strength plant fibre board made from sugarcane bagasse. Combined with Sugarcrete® — a high-load-bearing building material made from glue-free, cross-laminated particles — it forms a carbon-neutral, renewable connecting component with industrial series-production potential.

3

Macro Level

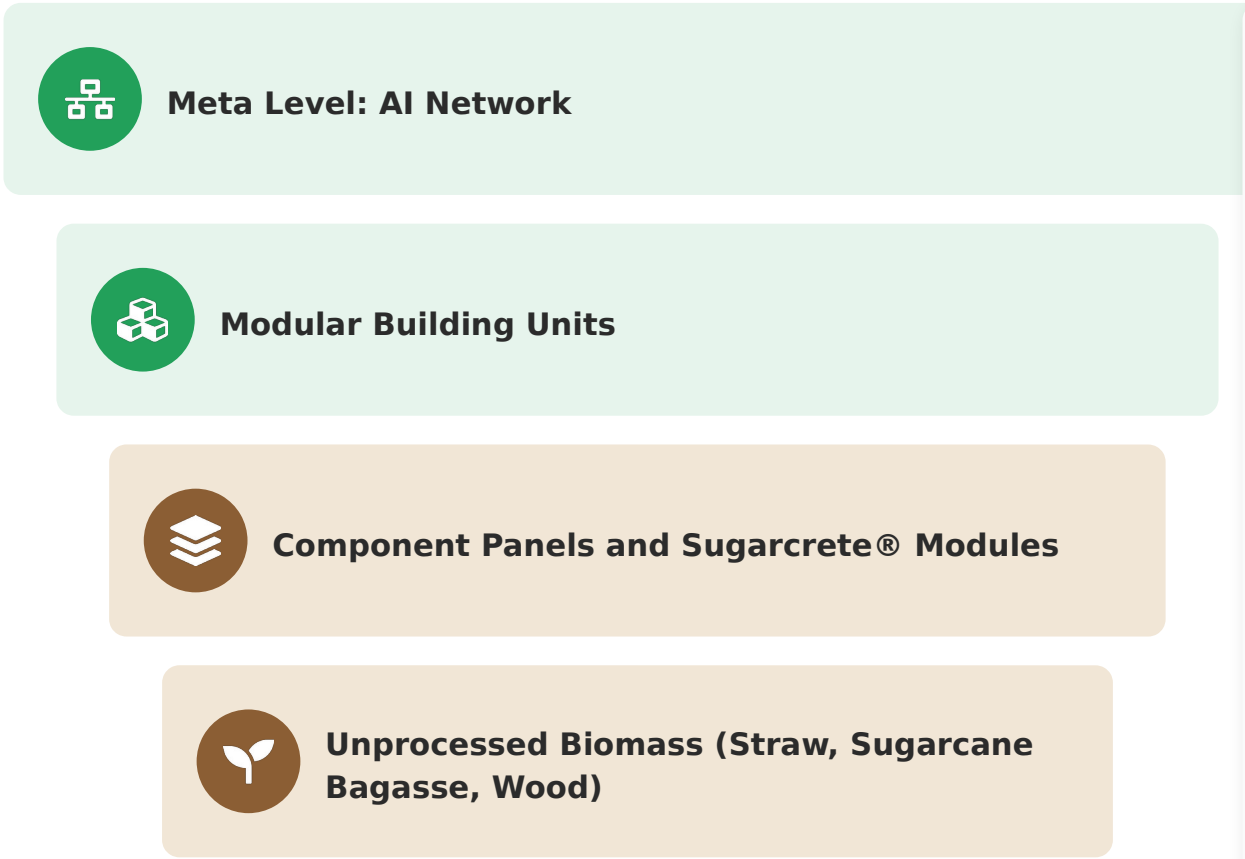
The system combines these materials into modular, fully prefabricated residential and commercial units — from six-storey standard units to flexibly adaptable modules — enabling the "plug-and-play" construction of the future.

4

Meta Level

An AI "brain" oversees the entire building management system and connects every module in real time via intelligent network nodes — for holistically intelligent control of energy distribution, operations, maintenance and urban planning.

System Overview of the Four Levels



This schematic shows the layered system: the bottom layer consists of unprocessed biomass (e.g. straw, sugarcane bagasse, wood), above that come component panels and Sugarcrete® modules, then the modular building units, and at the very top the intelligent AI network layer (represented by glowing blue nodes as the "meta level / AI brain").

The graphic illustrates the entire vertical integration process — from a waste product of the sugarcane industry to an intelligent, "living" building.

Bagasse Composite Compared to Conventional Concrete

Lifecycle Comparison Table

Metric	Low-Emission Material (Sugarcane-Bagasse-Based)	Conventional Material
CO_2 per m^2	**-8 kg (low, equivalent to carbon storage)**	+180 kg (high)
Weight	**Over 60% lower dead weight**	Heavy (100% reference value)
U-Value	**0.15–0.25 W/mK, excellent insulation**	1.5–2.5 W/mK, poor insulation
Recyclability	**Over 80% recyclable**	Less than 20% recyclable
Processing Time	**Fast processing in 48 hours**	28 days drying time required
Fire Protection	**ISO 1716:2021, A1, non-combustible**	Class A1, non-combustible
Sound Insulation	**Over 45 dB**	35–42 dB

Keeping Heat Out — Outstanding Insulation Performance and Material Advantages

Reinforced with highly efficient PUR foam, produced entirely sustainably from renewable raw materials. No plastic, no chemicals. Purely natural — and naturally effective.

Cool in Summer

As outdoor temperatures rise, the material effectively blocks heat transfer, keeping interiors noticeably cool.

Light as Wood, Strong as Concrete

The material is lightweight, thermally insulating, dimensionally stable and shrink-free — while offering structural strength that rivals conventional building materials.

Comprehensive Sound Insulation

It effectively absorbs noise from the building itself, the neighbourhood and traffic — delivering outstanding sound insulation and a noticeably better indoor climate.

Natural innovation. Light. Fresh. Quiet.

Sustainable | Resource-efficient | Greater wellbeing | Healthy living | Climate-friendly | Shaping the future together

Structural Revolution — Sugarcane Bagasse as a Building Material

Sugarcane bagasse is being transformed into a sustainable, robust and high-performance building material.

Material Innovation

A breakthrough in fibre application: sugarcane bagasse is mixed with hardened carbon and a fast-setting mineral binder. The material doesn't just store CO_2 like concrete — it actively absorbs additional CO_2.

Openness and Scalability

The formula is not patent-protected. This allows countries in the Global South to produce it locally — with significant transport cost savings and direct CO_2 reduction at sugarcane refineries.

Industrial Speed

A revolutionary leap in speed: under ambient conditions, only 48 hours pass from harvest to finished material.

Key Advantages

- Low CO_2 Emissions (Absorbs CO_2)
- Renewable (Uses Agricultural By-Products)
- Robust and Durable
- Global Impact (Strengthens Communities, Promotes Worldwide Sustainability)

The Self-Regulating Feedback Loop of VikaraPolyCube

An intelligent building that goes far beyond classic static construction. It is not a rigid structure, but a self-sustaining, self-powering energy unit. Compared to concrete and other heat-retaining materials, the façade — greened with annual and perennial plants — noticeably reduces temperature differences.

How Does It Work?

Real-Time Data Collection — AI

The system continuously collects real-time data on solar radiation, wind, façade temperature and building usage.

Intelligent Processing — AI

This data is analyzed to make autonomous decisions on resource management and ensure efficient building operation.

Holistic Control

The system controls the key output variables to minimize the building's environmental impact and optimize its ecological performance.

Result

A building that breathes, learns and takes care of itself — efficient, climate-friendly and in harmony with its surroundings.

Key Advantages

Energy efficiency, sustainable water management, natural thermal comfort, greater biodiversity, efficient operation.

The Vikara Shenzhen System — The Collapse of Concrete vs. the Evolution of Vikara

The Collapse of Concrete

Emissions Crisis

Cement production accounts for around 40% of global CO_2 emissions.

Structural Rigidity

Rigid floor plans force tenants to relocate when their residential or commercial needs change.

Resource Waste

Instead of adaptable renovations, change often means nothing but demolition and rebuilding.

The Evolution of Vikara

Carbon-Free Material

Built on the basis of revolutionary Sugarcrete.

Dynamic Spatial Geometry

Modular spaces that flexibly adapt to tenants' needs — expanding or shrinking as required.

AI-Controlled Energy System

AI-controlled, emission-free and fully recyclable.

Systemic Sustainability — No "Greenwashing"

The construction industry contributes significantly to global CO_2 emissions. With VikaraPolyCube, emissions across the entire lifecycle can be cut by up to 89%.

>45%

CO_2 Reduction in the Construction Sector

36 billion tonnes

Annual CO_2 emissions of the global construction industry

2041

Projected emissions peak if current trends continue

>85%

Emissions reduction achieved through VikaraPolyCube

Net-Zero Emissions

CO_2 balance during operation

Energy Sovereignty Instead of Centralized Dependency

VikaraPolyCube: an intelligent, self-sufficient and highly resilient high-rise built on conventional construction methods

Energy-Sharing Model (Conventional)

Centralized energy supply. A single central facility powers all units.

A single failure affects the entire building.

The entire building depends on a single central energy source.

VikaraPolyCube System (Innovative)

Every unit is energy self-sufficient. Every residential unit has its own independent energy supply system.

This includes: residential units, swimming pool, fitness room, elevators, entrance hall and communal areas.

Maximum resilience. Full control. Shaping a sustainable future together.

Homes as Energy Nodes

Every VikaraPolyCube module is delivered with a fully pre-configured energy infrastructure. This is seamlessly integrated into the façade and roof and includes photovoltaic elements as well as decentralized storage units.

What Is an Energy Node?

A unit that generates, stores and intelligently manages energy — while also being connectable to the smart grid.

Core Components

Integrated Solar Energy

Photovoltaic elements on the roof and façade continuously generate renewable energy.

Efficient Energy Storage

Decentralized, high-performance storage for maximum reliability.

Intelligent Energy Management

Optimizes energy generation, consumption and storage for maximum efficiency.

Economic Viability

The Vikara Shenzhen concept fundamentally reshapes the economic logic of construction: industrialization, material innovation and AI-driven optimization create substantial structural cost advantages. This is not a marginal efficiency gain, but a systemic shift.

How Do We Create Economic Value?

Industrialization

Standardized, repeatable processes in a controlled environment save resources, reduce waste and increase reliability.

Material Innovation

High-performance materials increase durability, lower lifecycle costs and reduce CO_2 emissions at the same time.

AI-Driven Optimization

AI algorithms optimize design, planning, logistics and construction execution to achieve maximum value.

Structural Cost Advantage

Lower direct construction costs significantly reduce total project costs.

Key Impact

Lower total costs Higher quality and consistency Shorter construction time Lower project risk Greater sustainability

Systemic Change: From the Traditional Model to the Vikara Model

Traditional Model

- Fragmented processes
- High variability and significant rework
- High dependence on manual labour
- Decisions based on experience and intuition
- Costs hard to predict, hidden risks

Vikara Model

- **Highly integrated, industrialized processes**
- **Consistently high precision and quality**
- **Technology enhances and multiplies human potential**
- **Data-driven, transparent decisions**
- **Structurally lower costs, predictable project timelines**

Integrated Mobility System

Vikara Shenzhen's buildings are not just places to live and work, but connected mobility hubs.

Short-Distance Transport

An autonomous robot network on-site handles short-distance connections between buildings. All Vikara Shenzhen buildings feature certified eVTOL landing pads (electric vertical take-off and landing) — fully prepared for the next generation of flying taxis.

AI-Powered Management

An advanced AI system coordinates all modes of transport in real time and optimizes trip planning, charging cycles and maintenance.

Mobility-as-a-Service (MaaS)

Residents and visitors use a single platform to seamlessly access all mobility services — from bicycles to car-sharing to flying taxis.

Key advantages: sustainable, efficient, comfortable, safe, future-ready. Vikara Shenzhen combines technology, sustainability and comfort into a city of the future.

维科来

Outlook and Contact

We warmly invite interested strategic partners, investors and public institutions to join us on this journey.

For more project information, please visit:

www.vikarashenzhen.ai

Disclaimer

All data, concepts and figures in this document are for illustrative purposes only and are non-binding. They do not constitute a legally binding commitment or guarantee. Changes to planning, technology, regulation and market conditions may occur at any time. Vikara Shenzhen Ltd. accepts no liability for decisions made on the basis of this information.