



Company Portrait



SMARTER HABITAT: From hemp and popcorn to a house: a sustainable building material for global climate change

SMARTER HABITAT's mission to create affordable housing for millions of people around the world can be summarised as succinctly as it is simple. The triad of ecological, economic and social-humanitarian responsibility determines the roadmap of the Munich-based company founded in 2019. The goal: to create a building material from "green" biobased materials and agricultural waste that can be produced regionally in large quantities in a cost-effective and energy-saving way and can also be installed there quickly and easily. The product: ecoHAB© - a plant-based lightweight construction panel developed in cooperation with the Fraunhofer Institute IMWS and the University of Göttingen - meets all these requirements. SMARTER HABITAT will license the know-how worldwide and thus contribute to solving one of the most pressing problems on this planet.

In the beginning was an "Awakening"

When Datty Ruth, CEO of **SMARTER HABITAT**, visited Haiti two years after the devastating earthquake in 2012, he was driven by the impression of the inhumane accommodation and the disastrous rubble field in which many people had to lose their lives by the vision of providing people with a decent roof over their heads. In view of the increasing number of trouble spots worldwide - be it due to natural and climate disasters, poverty or wars as well as the resulting streams of refugees - but also the increasing need for housing, this vision became a mission. As early as 2013, he took up this great social-humanitarian challenge and decided to do everything in his power to make affordable, safe and environmentally friendly

housing available to everyone, everywhere. According to estimates by UN-Habitat and the World Bank, there is already a shortage of around 300 million houses for more than two billion homeless people, and this number is expected to double by 2030 - not counting the estimated 80 million refugees worldwide.

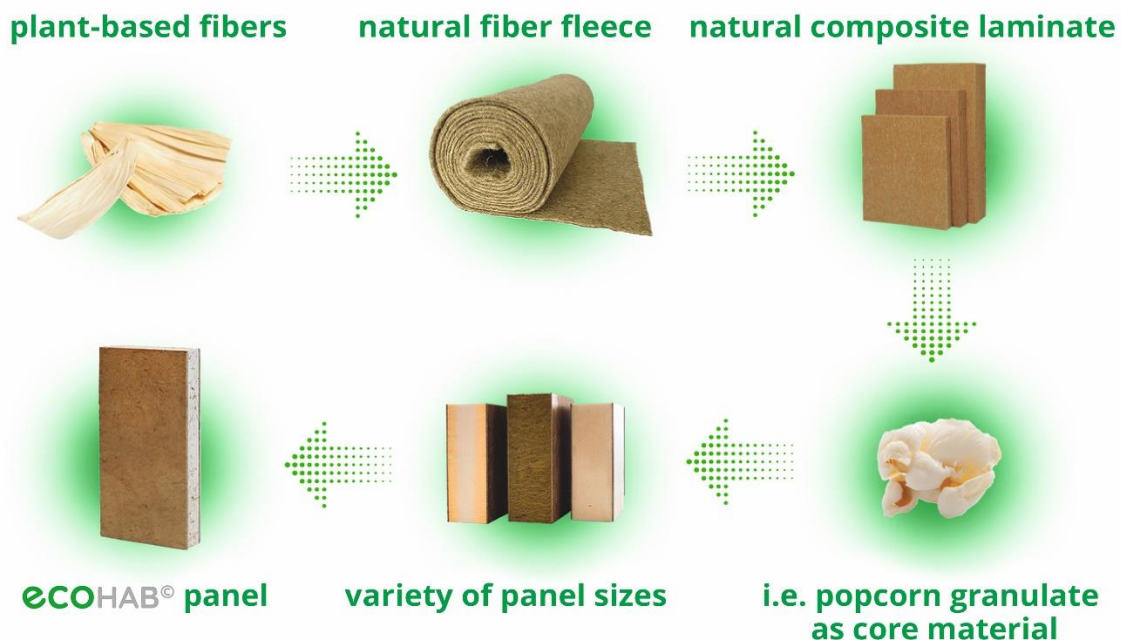
ecoHAB® – from Idea to Product

SMARTER HABITAT has now achieved this goal with its composite **ecoHAB®** panels and has come a big step closer to this goal. After years of research and development, supported by a network of experts from science, technology and industry, a building material has been created which, as a "green" alternative, will not only revolutionize the building industry in the future, but also accelerate the paradigm shift towards more responsible sustainability in construction.

ecoHAB® Sandwich panels consist of two basic components: Natural Fibre Laminates as the outside layers and a core material made of popped corn granulate, all which can be produced in a wide range of technical variants.

The Natural Composite Laminates (NCL) generally consist of natural materials such as hemp, flax, sisal or rice straw and many more other long-fibre agricultural waste, which are processed into a fleece felt and compressed with a special resin under high pressure.

Process from Natural Fibres to ecoHAB® Panels



In cooperation with the renown Fraunhofer Institute for Microstructure of Materials and Systems IMWS in Halle (Saale), as one of the research institutions of the Fraunhofer-Gesellschaft, and C3 Technologies GmbH, the material and process engineering foundations for the industrial production of **ecoHAB®**- laminates were laid in the course of several years of joint research and development work.



Since 2016, a prototype house has been on display at the institute's premises proving how sustainable, simple, cost-effective and indefinitely declarable building can come together in the future. By acquiring a stake in C3 Technologies GmbH, **SMARTER HABITAT** has secured this innovative knowledge for transferring the process from laboratory scale to production-ready industrial manufacture of the composite panels.



Show house of the Fraunhofer Institute in Halle (Saale), which was built from NCL panels in 2016 and shows no signs of weathering to this day.

Material Technology “Made in Germany”

At the same time, the research group "Chemistry and Process Engineering of Composites" at the Faculty of Forest Sciences and Forest Ecology at the University of Göttingen/Germany, which has been conducting research in the field of renewable raw materials focusing on popcorn for years and has developed a popcorn granulate as a composite material for laminates made of hemp and flax, which can replace the PU foam used for panels so far in the future. The head of the research group, Prof. Dr. Alireza Kharazipour - fondly dubbed the "popcorn professor" - sees this unique process as an outstanding opportunity to replace the raw material-intensive and moreover energy-intensive products made of cement, gypsum or petroleum-based foams and plastic used in the construction industry with a cost-efficient, almost fully natural product. Prof. Kharazipour has obtained several patent rights in 14 years of research work.



Popcorn granules - the ideal core material for panels made of natural fibre laminates.



In addition to excellent physical properties, **SMARTER HABITAT**'s new building material is also reusable, recyclable and compostable and embodies a holistic sustainability claim like hardly any other product through the cradle-to-cradle principle. **SMARTER HABITAT** has signed a licence agreement with the University of Göttingen, which secures the commercial rights to use the patents for production and distribution of the **ecoHAB**®- panels on a worldwide scale.

Synonym for a Building Material that is Profitable at all Levels

In every regard ecologically, economically and humanitarian, the innovative **ecoHAB**®-panels manifest an outstanding balance in terms of raw material, as well as material and production efficiency, in contrast to conventional building materials:

► ***Sustainability goals are met***

- circular building material from plant-based raw materials or their waste,
- vastly reduced energy use, as no sand, cement, steel, gypsum, etc. –all with high energy- and water-intensive construction and requiring heavy machinery are used,
- environmentally friendly production from regionally/locally available raw materials,
- optimized heat- and sound insulating properties,
- extremely durable: waterproof, fire-resistant as well as mould -and vermin resistant,
- high load-bearing capacity and outstanding stability.

► ***Lightweight construction that pays off***

- inexpensive building material,
- simple lightweight construction with faster and more efficient assembly
- (approx. one week for a 50m² house),
- reduced assembly, transport, logistics and energy costs,
- improved working conditions due to reduced dirt and dust pollution,
- suitable for all types of surface treatment,
- consistently high quality and good scalability due to industrial production.

► ***Affordable housing meets global needs***

- Promoting modern, climate-friendly and humane residential architecture,
- quick and easy to implement globally through on-site production,
- cost-effective through the use of regionally and locally available raw materials,
- creating jobs in the construction sector and the possibility of using mostly even unskilled labour,
- significant improvement of living conditions for people threatened by housing shortages.

► ***Universally applicable***

- load-bearing structural elements for exterior walls, foundations, roofs and ceilings.
- non-load-bearing applications such as partition walls or dry walls,
- decorative applications such as cladding, kitchen or sanitary elements.,
- multitude of further applications: trade fair -and shop construction, mobile homes and tiny houses, interiors construction for cruise ships, yachts, airlines etc.



► **UN Sustainable Development Goals (SDGs)**



A valuable contribution to the United Nations Sustainable Development Goals

<p>1 NO POVERTY</p>	<p>4 QUALITY EDUCATION</p>	<p>8 DECENT WORK AND ECONOMIC GROWTH</p>	<p>9 INDUSTRY, INNOVATION AND INFRASTRUCTURE</p>
<p>Making housing space affordable</p>	<p>Supporting modern school building</p>	<p>Job creation in the building and construction industry</p>	<p>Promotion of sustainable building</p>
<p>11 SUSTAINABLE CITIES AND COMMUNITIES</p>	<p>12 RESPONSIBLE CONSUMPTION AND PRODUCTION</p>	<p>13 CLIMATE ACTION</p>	<p>17 PARTNERSHIPS FOR THE GOALS</p>
<p>Supporting the creation of modern and sustainable cities</p>	<p>Climate-friendly production from locally available natural materials</p>	<p>Significantly reducing energy consumption and CO₂ emissions</p>	<p>Close collaboration with regional communities</p>

In total, **ecoHAB®** panels contribute to 8 out of 17 of the Nations Sustainable Development Goals (SDGs) set by the United Nations. They have the potential to fundamentally change building in the future and thus alleviate the global housing crisis.. The need for affordable housing is immensely huge - in developing and developed countries alike. UN Habitat estimates that by 2050, some 3 billion people will be without adequate housing, representing a market of 424 billion US dollars. Governments and NGOs around the world are allocating tremendous budgets to reduce this shortage.

A value-based Business Model for rapid Global Market Development

The prerequisite for this is the expansion of two business areas:

► **SMARTER HABITAT- Pilot Factory**

SMARTER HABITAT's pilot factory is responsible for the production of **SMARTER HABITAT** products (panels to complete kits for houses) in the German and European market. In particular, reversible partition walls made of natural products as a substitute for environmentally harmful plasterboard walls are in focus. Mostly for more cost-effective redensification in urban conurbations or the trend towards "low-cost building" with smaller residential units and tiny houses.



Other tasks of the pilot factory are development and testing of new materials (e.g. new resins, new natural fibres, etc. on an industrial scale), as well as the continuous improvement of production processes -and the design of production facilities for the licensees, including planning of technical services. The pilot factory is located in Ramstein, Rhineland-Palatinate, Germany, with existing production facilities. It is also serving as a training centre for national and international licensees.

► **SMARTER HABITAT- License (Franchise-Concept)**

The main driver for a successful rollout of the **SMARTER HABITAT** building elements and a rapid market penetration is international licensing of the **ecoHAB®**- material and production technology. This is granted by the licensing company via a master licence to construction companies which manifest strong sales and good credit ratings. With the master licence, the licensees acquire not only the **ecoHAB®**- technology, but also certified, highly automated, turnkey production lines, i.e. the entire know-how for the production and marketing of all **SMARTER HABITAT** products and applications.

In return, the licensees must meet the capacity requirements for the agreed sales volume in their market. They can sign up further regional sub-licensees to ensure nationwide distribution in their respective territories. They will use two thirds of their respective **ecoHAB®**- production for low-priced **SMARTER HABITAT** homes. In addition, they must contractually commit to the value-based corporate philosophy laid down in the "**SMARTER HABITAT** Code of Ethical Conduct".

Investing in a Good Cause

Against the backdrop of increasing number of climate catastrophes, which have caused massive damage in many regions of the world, it is high time for a general "Rethink". As early as 2020, the World Economic Forum listed the risks triggered by climate change among the top 5 in its Global Risk Report and sees Environmental, Social and Governance-Risks (ESG) in particular, i.e. the greatest risks with enormous social and economic implications. Therefore, the motivation to make a positive contribution to a sustainable future for the environment and society should be great. Even more so, since an investment in environmentally friendly, CO₂-neutral technologies not only translates into returns, but - as **SMARTER HABITAT**'s business model clearly shows - can also fundamentally improve the living conditions of millions of people.

In order to move from the project planning phase to implementation, the company is raising capital for its investments. The options for impact investors are direct participation as limited partners or via subordinated loans. Detailed financial plans and conditions can be requested. In addition, there is the possibility for smaller investments and social-humanitarian-oriented persons to get involved via crowdfunding approved by BAFIN, the official German regulation institut. The call is open to all those who want to participate in a good cause and attach importance to a sustainable and promising investment - private individuals as well as institutional investors or private equity and venture capital companies.

For further information contact: Smarter Habitat GmbH & Co.KG; Baierbrunnerstraße 25-29
81379 Munich, Germany; Tel.: +49 89 212 314 811E-Mail: info@smarter-habitat.com
Web: www.smarter-habitat.com



SMARTER HABITAT-Management

The management team consists of internationally experienced individuals who excel in the development of the global licensing business, in the production and development of innovative material -and construction technologies, and in general management. SMARTER HABITAT is initiated, led and managed by:



CEO Datty G. Ruth was formerly CEO of an M-DAX stock-market listed entertainment company for 30 years and has great experience in international licensing business. His task is to win international cooperation partners and licensees for SMARTER HABITAT. As the "spiritus rector" he further develops the business model in all areas - always keeping an eye on establishing a contemporary social-humanitarian and globally active company.



CFO Christian F. Bennhold, has over decades gained extensive and varied knowledge in the field of auditing and as a commercial manager, CFO and consultant. These positions have taken him from start-ups to small and medium-sized companies as well as internationally active stock-listed companies and also companies from the private equity environment. He assumes responsibility for the financial area.



CAO Michael Gassner has many years of experience in sales and organizational development as well as sound know-how in the lending and financing sector. He was formerly managing director of a financial services company for 10 years. Michael Gassner is in charge of the General Administration of the company.



CTO: Dipl. Ing. Klaus-Jürgen Lauth is a mechanical engineer by trade and a specialist on complex buildings with in-depth knowledge on automated production plants. Here, he has 25 years of international experience – also as a consultant to the Automotive and Data Center Industries. He developed an ingenious storm- and earthquake protection system for wooden houses. At SMARTER HABITAT he is responsible for setting up the pilot production plant and planning and developing turn-key factories for our licensees.



SMARTER HABITAT- Advisory Team

The management team of **SMARTER HABITAT** is supported by a number of internationally renowned advisors who contribute their expertise to the company:

Hemmelrath Compagnie, led by Prof. Dr. Alexander Hemmelrath, combines tax, legal and business advisory services for **SMARTER HABITAT** into a holistic range of services. The current focus is on business management advice, which is provided under the leadership of Konstantin Hemmelrath.

Dr Nndi Nnoli-Edozien, Advisor on Corporate Sustainability and Governance/Board Member, is an expert on social entrepreneurship and sustainability. She established the Seven Pillars of Sustainability, based on 20 years of research, in Africa's largest company. She will advise **SMARTER HABITAT** on sustainability, corporate governance and international business development. Dr Nnoli-Edozien is a member of the Club of Rome.

Benedikt Hoffmann, Advisor on International Finance/Board Member, has decades of experience as a bank manager with a regional focus on international growth markets. He has led banks in various emerging markets and cultural environments. As an expert in various international regulatory and accounting standards, he will contribute his knowledge in the context of international finance.

Peter Schalburg, MBA, Advisor Licensing, has spent most of his career managing international franchises. He has many years of international experience in all major markets, including 15 years as President and CEO of Midas Europe and South America with more than 600 franchisees/licensing partners.

Dipl. Ing. Anabela Macieira, Advisor Engineering and Construction, is an international award-winning architect, owner of Core Architects - one of the few "Passive House" and NETZEB certified architectural practices in Portugal. She designs nature-inspired, sustainably chic buildings that support the holistic health of their occupants. Government-approved projects that even exceed the latest sustainability standards use **SMARTER HABITAT's** innovative building materials.