

PRESS RELEASE

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Creating living spaces for people: The »Fraunhofer CityLaboratory« at BAU 2017

Digitization and urbanization, resource and energy efficiency, demographic change and climate change are long-term megatrends that require intensive examination by society, economy and research. The building industry, too, is requested to provide innovative and sustainable solutions in order to meet the constantly growing requirements on buildings. In this context, thinking across all industries and sectors as well as taking interdisciplinary action continues to gain importance. The Fraunhofer Building Innovation Alliance combines the professional competence of 14 Fraunhofer institutes to provide interdisciplinary solutions for the building industry. In the scope of its special show »Fraunhofer CityLaboratory – Creating living spaces for people« introduced at the BAU 2017 trade fair, the Fraunhofer Building Innovation Alliance presents innovative products and solutions from building research in Hall C2, Booth 538.

According to an analysis conducted by the HypoVereinsbank and Roland Berger, the building sector in Germany has experienced a positive development since 2011 – a trend which is set to continue. For the German building industry, this study predicts an annual growth rate of 1.5 percent in the next few years. Between 2010 and 2015, the average annual growth already was 1.3 percent. With this, the German building sector had the fifth-largest rate of growth in the EU in the respective period, inferior only to Poland, Great Britain, Sweden, and Belgium. However, such figures cannot be taken for granted. In this context, particularly the increasing demand for housing space in metropolitan areas in the wake of urbanization boosts growth. Besides, other trends such as energy retrofitting of buildings, increasing digitization in the building sector, and demographic change also give new impetus to growth.

Building research and the building industry need to find answers to complex questions: How can the principle of sustainability be more firmly embedded in the construction process and in building operation, in order to better protect resources and the climate? How may increasing digitization be integrated in everyday building routines? How must spaces be designed to ensure both safety and a versatile and healthy living environment?

With its Building Innovation Alliance, the German Fraunhofer-Gesellschaft provides the market with a single, central contact for integrated system solutions and market-oriented products relating to construction topics. Visitors of the BAU 2017 trade fair can become acquainted with the diverse developments in applied building research at the special exhibit »Fraunhofer CityLaboratory – Creating living spaces for people« displayed in Hall C2, Booth 538. Here, the 14 member institutes present innovative and sustainable solutions for products and systems relating to four topics, namely:

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FRAUNHOFER BUILDING INNOVATION ALLIANCE**Digital planning, building and operating**

For several years now the German construction industry has been coping with a below-average productivity growth. As laid out in the afore-mentioned study, the productivity in the building sector merely improved by 4.1 percent between 2000 and 2011, while the overall German economy increased by 11 percent in the same period. Last, but not least, this fact is also due to the hesitant reaction to the requirements posed by the fast-developing digitization. Industry 4.0 has become common practice by now, »Building Industry 4.0« has not.

A 2015 study conducted by the Fraunhofer Institute for Industrial Engineering IAO has shown that Building Information Modeling (BIM) was currently being used mainly in larger projects. Nonetheless, a 2014 EU-directive includes the use of BIM as a criterion in public tendering. Following this directive, the step-by-step plan »Digital Planning and Building« issued by the German Federal Ministry of Transport and Digital Infrastructure requires the use of BIM in public infrastructure projects in Germany as of 2020. Not least owing to these requirements and the great potential held by this software-supported method of optimized design, execution and operation of buildings, member institutes of the Fraunhofer Building Innovation Alliance are conducting joint research with companies in this field. Yet, IT-supported methods such as digital planning using BIM are just the beginning. For the future, digitization along the entire value-added chain is envisaged, from design and construction, building use and operation through to demolition and recycling. Beside sustainable design and control processes, optimization plays a key role in all building measures. Building optimization allows to improve quality and to prevent expensive long-term consequences.

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Intelligent facades

Multifunctionality and energy efficiency describe the increasing requirements on modern facades as interfaces between the urban environment and an interior space. Being integral components of buildings, they not only have an architectural and a functional impact, but also economic and environmental effects. Safety and comfort experienced inside a building are increasingly complemented by the supply of energy and a positive effect on the urban space. This is why researchers of the Fraunhofer Building Innovation Alliance develop and optimize innovative facade systems and concepts. Substantial new findings are presented: solar thermal facade units, photovoltaic modules featuring an innovative connection to bearing structures, components suited for vertical planting, units made of renewable raw materials for both external and internal walls.

Safety and comfort

Numerous threat scenarios such as extreme weather events, earthquakes or terrorist attacks require the reliable protection of buildings and infrastructure. The Fraunhofer

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institutes aim at reconciling these safety aspects with tasks of quality assurance, architectural design and the functionality of structures. In addition to requesting security, building users tend to attach greater importance to comfortable indoor environments. Draft-free ventilation or living and working without being exposed to noise are just two aspects of many requirements contemporary building users want to be fulfilled in their environments. After all, human beings spend about 90 percent of their lifetime (on average) in indoor spaces. This is why building research aims at achieving optimum thermal comfort and a performance-enhancing indoor environment while limiting the use of energy and natural resources to a minimum.

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Resource efficiency and energy management

Buildings and the infrastructure of urban centers are ranging among the biggest energy users worldwide. To ensure that the targets of energy policy will be accomplished in Germany and in many other countries, the focus is particularly on cities, which are required to improve their use of energy saving potentials. If the consumption of non-renewable energy shall be reduced and fossil fuels and other resources are to be saved, it is not sufficient to enhance the energy performance of buildings – the energy supply of buildings also needs to be improved. Another focus relating to this topic is on saving or substituting limited resources. The fact that the worldwide use of primary materials has doubled in the last 30 years underlines the vital importance of this issue. The Fraunhofer Building Innovation Alliance is working on a wide range of diverse, innovative solutions. In addition to developing and using construction and insulation materials made from renewable raw materials, certain resource-saving measures can be implemented already before the construction work begins. Detailed analyses of the origin and the environmental impact of construction materials, making the most effective use of these materials, and ensuring their subsequent recyclability are further key levers prioritized in the research and development work carried out by the Fraunhofer Institutes.

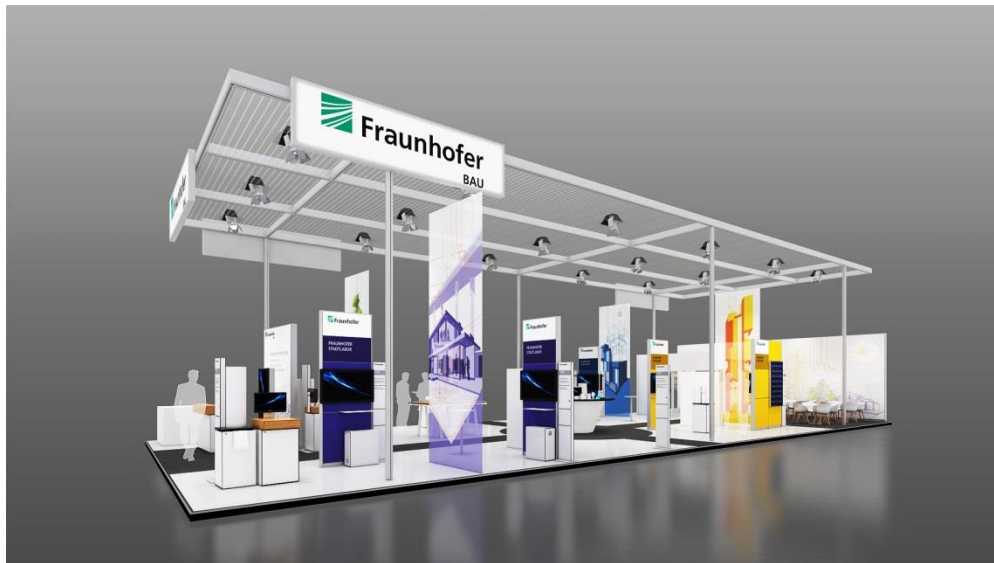
Please find more information on the research fields of the Fraunhofer Building Innovation Alliance and its Institutes on our website: www.bau.fraunhofer.de/en

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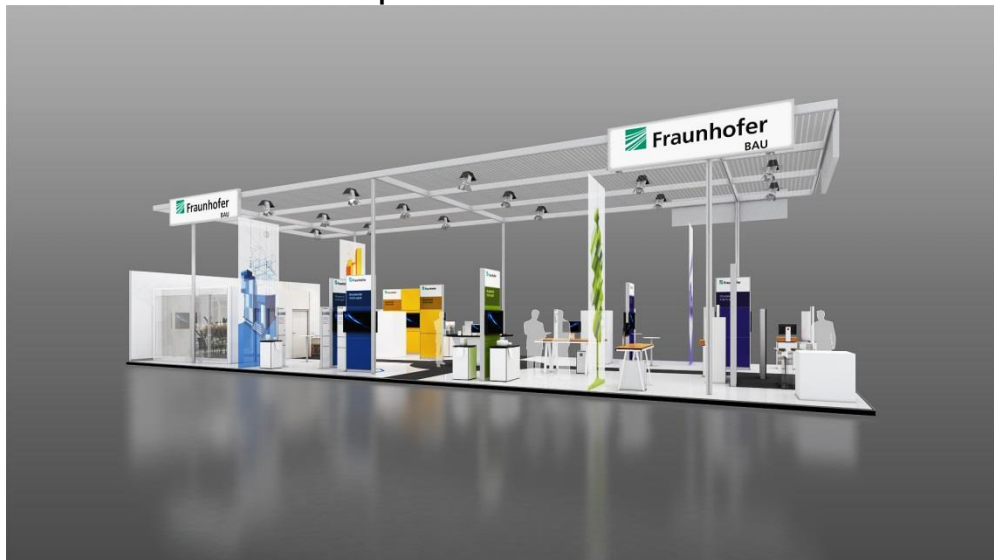
The Fraunhofer CityLaboratory – an overview

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The **Fraunhofer Building Innovation Alliance** clusters resources and competences of 14 Fraunhofer research institutions relating to building construction, thus providing the market with a single, central contact for integral system solutions in the areas of design and construction. The extensive portfolio addresses both medium-sized enterprises and large construction companies. The Fraunhofer Building Innovation Alliance sees itself as an indicator and Initiator of new and innovative topics relating to building research, assuming the function of an interface between economy, research and politics. Clients' inquiries are centrally collected in the head office, from where they are forwarded to a member institute specializing in the respective issue. International contacts and partnerships enable Fraunhofer to advise companies with global operations.

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