

'High Time for a Sustainable Construction Revolution'



At the Drees & Sommer in-house event in Cologne, they discussed solutions for more sustainability in the construction and real estate sector: (from left to right) Thomas Thümmeler, expert for energy management and sustainability, Tanja Sprenger, responsible for sustainable urban development, Anne Kloubert, responsible for ESG in Real Estate Consulting (all Drees & Sommer North Rhine-Westphalia location), moderator and influencer Louisa Dellert, climate researcher Prof. Hans Joachim Schellnhuber and Stefan Heselschwerdt, location partner Drees & Sommer North Rhine-Westphalia.

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Cologne/Stuttgart, Germany, March 3, 2023. Blockades in front of lignite power stations, protests on urban highways or voluntary decisions to avoid air travel. We all know about the harm caused to the climate by fossil energy sources and our common modes of transport. But people do not yet sufficiently realize the toxic effect of the construction sector on the climate, although about 40 percent of global greenhouse gases is attributable to the construction industry. In addition, half of the world's waste results from the construction or demolition of buildings. What must be changed as quickly as possible, and what opportunities can this create? Yesterday, these questions were addressed by the climate researcher professor Hans Joachim Schellnhuber and the moderator and influencer Louisa Dellert, who is known for her work on sustainability topics, at Drees & Sommer's *Earth for all* inhouse event in Cologne.

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Building without creating waste for the future? In its new building *The Cradle*, the project developer Interboden shows what is already possible in an office building based on the recycling principle: a core built with recycled concrete, a modular timber load-bearing structure and a striking wooden façade. As far as possible, natural materials suitable for recycling are used in the Düsseldorf's media harbor. Compared with traditional structures, carbon emissions are reduced by around 40 percent. Moreover, the energy efficient building design will represent a valuable repository for materials. The client is supported by the environmental consultants of EPEA, a subsidiary of Drees & Sommer SE who specializes in construction and real estate advisory services. This building anticipates the future with its digital building resource passport, which is like a climate driving license for properties and is also demanded by the German Federal Minister for Housing, Urban Development and Building, Klara Geywitz. Sooner or later, the regulations which are planned within the European Union and at a national level will force the industry to create circular processes for materials. This means that when buildings are later demolished, they will be treated as repositories of raw materials for new buildings.

'In the new construction sector, for example, our industry has already reached a very good level with plus-energy houses and many other energy efficiency standards and initiatives. We are also developing and strengthening the Cradle to Cradle approach, a circular concept for materials in all branches of industry for which the construction sector is playing a pioneering role.

Our major problem lies in existing buildings. Here, conversion and alteration must not be synonymous with demolition,' explains Stefan Heselschwerdt at the *Earth for all* event in Cologne. As a Partner at Drees & Sommer, he heads the company's team in the German federal state of North Rhine-Westphalia.

'Many existing buildings are not suitable for the future energy requirements. This is not only expensive for the residents due to the dramatic rise in gas and energy prices. It will become really painful when the devastating consequences for the climate are clearly seen. It is already high time to introduce a comprehensive sustainable construction revolution,' says professor Hans Joachim Schellnhuber, founding director of the Potsdam Institute for Climate Impact Research and founder of Bauhaus Erde gGmbH.

He wants to reactive an idea from the Bauhaus movement – and he advocates a systematic use of recyclable construction. 'Without a radical sustainable construction revolution with a bio-based circular economy, we will fail to achieve our climate goals', professor Schellnhuber warns. To halt global warming, and especially to reverse it in the long term, carbon dioxide must be removed from the atmosphere – especially by extensive reforestation, sustainable

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land use, and last but not least by the widespread use of wood and other regenerative raw materials as a CO₂ repository in urban construction.

The influencer Louisa Dellert agrees that a willingness to change is an important ingredient to halt global warming and ensure a sustainable way of life. 'A sustainable lifestyle is one way to take responsibility and work towards the protection of the climate and a healthy environment.' She says that every person must realize where they can take responsibility. She adds that nobody can save the global climate alone – that this requires a joint major effort.

Using Products, Buildings and Infrastructure as Repository

The first step towards a genuine circular economy in the construction and real estate sector is to identify the planned or existing materials in individual new buildings or refurbishment projects and to assess their suitability for recycling – and to depart from the conventional concept of demolition.

Even the name of the innovative Dusseldorf office building, *The Cradle*, reflects the program which is based on the Cradle to Cradle concept. At the end of the 1990s, the German chemist Michael Braungart and the US American architect William McDonough collaborated to develop a sustainable concept of a circular economy: *Cradle to Cradle*, abbreviated as C2C. This uses the image of a baby's cradle to illustrate a circular process from one baby to the next, 'from the cradle to the cradle'. Applied to the construction industry, this means that the building owners should already think of the later demolition even when they are constructing the building. In simple terms, it therefore means avoiding waste at the end of the building's life cycle, so that the raw materials used in the building can be reused as far as possible in the same quality in new construction projects. To achieve this, all materials used in the building must be installed in such a way that they can be removed separately and recycled in a non-polluting way. 'This ensures economy of resources and saves disposal costs – not only at the end of the life cycle. The building thus becomes a sort of material warehouse and a repository of raw materials,' explains Stefan Heselschwerdt, expert in construction and real estate.

Old Bricks – New Life

What is left over after the demolition or refurbishment of a building is then not waste – it consists of valuable raw materials. This concept is also known under the term *Urban Mining*. In principle the underlying idea is an old concept. Historically, town dwellers dismantled

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whole castles brick by brick to use them in the construction of new buildings. After the Second World War, the ‘rubble women’ in Germany also used destroyed buildings as urban repositories of building materials. They collected as much reusable material as possible from the rubble.

‘We can no longer afford to neglect the recyclable treasures which are concealed in our cities if we take the climate crisis, the shortage of raw materials and the rise in the costs of energy, waste disposal and construction materials into account,’ says Drees & Sommer Partner Stefan Heselschwerdt.

Urban mining begins with a comprehensive view of the raw materials and their recovery – and it regards products, buildings and infrastructure as a repository of materials which are comparable in value to the natural raw materials found on the earth. For example, the timber which is part of an old building can be used to construct window frames, doors or even the roof trusses for a new building. Bricks, insulating materials, pipes and cables – everything can be reprocessed and recycled. Thus, urban mining offers significant benefits, especially in ensuring reliable and sustainable material supply chains.

The new environmental regulations will make urban mining competitive, especially as building owners will be keen to ensure that their buildings will conform with the future building standards and sustainability requirements.

As in every market, there are market pioneers and latecomers. To ensure a successful transition to the creation of recyclable buildings, it is important to achieve and harness a shared momentum which will stimulate investment in innovations. ‘Investors, project developers and the financing banks are called upon to leave their conventional paths and promote a sustainable change’, climate researcher Hans Joachim Schellnhuber emphasizes.

The Materials Passport Gives Information about Building Materials and Their Effect on the Environment.

Influencer Louisa Dellert says that companies in general must take more responsibility for sustainability and the protection of the climate. This is also necessary for economic reasons, since clients are becoming more critical and more likely to question what they are told. - Louisa Dellert suggests that young people in particular quickly realize when adverts make false claims and engage in greenwashing. ‘It is more challenging for businesses to sell their products already today . This critical approach of consumers will probably be something that business companies will increasingly encounter in the coming years.’

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Therefore, it is not only important to communicate recyclable building to the outside world, but also to be able to prove it. The instrument that can be used to demonstrate this is a digital building resource passport which shows the materials which have been installed in the building. A list of the types of materials used will be as important as the details of any critical substances which are in the building. It should show the building and demolition waste which will be created and the proportion of regenerative raw materials and reused or recycled materials. The building resource passport should also describe the environmental impact of the building over a reference life cycle of 50 years, the calculated ecological balance for greenhouse gas emissions and the demand for primary energy from non-renewable energy sources.

The German government has resolved to pursue the goal of introducing this building resource passport – and has defined this goal in its coalition agreement – but the project has not yet been implemented. At present, there are only a few lighthouse projects with a detailed materials passport, such as *The Cradle* in Dusseldorf and Drees & Sommer's new corporate building, *OWP12*, in Stuttgart.

The Information Contained in Building Resource Passports Is of Value to the Individual Users too.

The data contained in a building resource passport is not only important for project developers and the owners of a building, it is also of value to the individual users. It will enable them to find out directly how the building will affect their personal carbon footprint. This information is also relevant in the light of another suggestion made by climate researcher Hans Joachim Schellnhuber. He would like to introduce an individual CO₂ threshold and at the same time establish private trading with CO₂ rights. 'Everybody will be allocated three metric tons of CO₂ per year. If you need more, you will have to buy it,' the climate researcher proposes. The sellers of CO₂ rights would be people who consume less – so this would give them a financial incentive to put sustainability principles into practice. Schellnhuber suggests that this would respect the three metric tons as a 'planetary guideline' in a free society, but at the same time accept the scope of flexibility which a market can provide.

Three million metric tons of carbon dioxide is not an arbitrary number, it corresponds roughly to the calculated CO₂ budget which would be available to everyone up to the middle of the century if we wish to achieve the ecological levels defined in the climate goals. However, people in Germany are a long way from this target. At present, every individual in Germany

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has a carbon footprint of about ten metric tons per year. However, professor Schellhuber is convinced that a visible price for emissions could influence purchase decisions and the consumption of energy. In addition, it could heighten awareness of the problem. That, in turn, would also affect the real estate sector, since it would create an incentive to move into an apartment in a building constructed in line with the Cradle to Cradle principle or to work for a company which has its offices in such a complex, because this would have less impact on the personal carbon budget. This would make it easier for the users of a building to take their personal responsibility for a more sustainable life style.

Influencer Louisa Dellert emphasizes that 'Sustainability means not living at the cost of future generations. We are all called upon to find a way out of the ecological pyramid structure which uses the resources of the future to pay for the present.'

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