

## Press Release from Biberach University of Applied Sciences

March 08, 2021

### *Solar Decathlon Europe 21*

### **HBC team relies on wood and multifunctionality - and receives support from the state of Baden-Württemberg**

Urban building tasks of the future: this is the subject of the international student competition "Solar Decathlon Europe 21" (sde21), for which three universities from Baden-Württemberg are qualified, including Biberach University of Applied Sciences (HBC). The participation of the universities is supported by the state of Baden-Württemberg, which is "aware of its pioneering role for a climate-conscious building culture with wood and the transformation of the building sector," as Peter Hauk, Minister for Rural Areas and Consumer Protection recently emphasized. Thus, the Biberach team X4S receives funding of 80,000 EUR as part of the program "Holzbau-Offensive BW" to be able to transfer the results from the project into teaching. With their project plans, the university teams present intelligent timber construction solutions for urban post-densification and offer innovative concepts for the advancing urbanization with accompanying housing shortage and rising real estate prices and, on the other hand, the adaptation of cities to climate change, the minister continued. All of Baden-Württemberg's universities are focusing on wood as a building material, which can be used to expand and upgrade existing structures simply and efficiently. The competition thus forms a large intersection with the goals of the "Holzbau-Offensive BW", and the results can also be "wonderfully transferred to the southwest," Minister Hauk explained.

According to Professor André Bleicher, Rector of Biberach University of Applied Sciences, the competition puts an important, social issue at the center of considerations and highlights that Biberach University of Applied Sciences is well positioned with its holistic orientation: "What concepts can we develop to create sustainable cities that offer sustainable buildings for living and working and to promote communal living?" To find the right answers to these questions, different

disciplines need to collaborate and offer solutions that can be quickly put into practice, Bleicher said. "That is the essence of a transfer university like HBC." And so the Biberach team, which goes by the name "Extension for Sustainability" - X4S for short - is made up of engineers for energy, timber construction, building and project management, as well as architects. Under the project management of Lena Frühschütz from the Institute for Building and Energy Systems, they are focusing on energy efficiency in addition to wood as a building material. The idea: the multiple use of building components. "The load-bearing capacity of wood, for example, can be significantly improved by additive elements. That's why we combine building technology and structural engineering and thus develop new approaches to solutions," explains Professor Jörg Schänzlin, head of the Institute for Wood Construction at Biberach University of Applied Sciences.

A concrete example: a wall as a connecting element of structural engineering, electrical engineering, building physics and interior design. "We want a wall that can do more and perfectly combines functionality with aesthetics," says Anna Diemer from the architecture course, describing the approach, in which the electrical supply is integrated into the wall elements in such a way that the individual living areas can be flexibly electrically supplied, illuminated and furnished. The team also considered the increased requirements for sound insulation, as building physicist Professor Andreas Gerber from the Institute of Building and Energy Systems explains: "If we use layers that are acoustically required as heat storage, we can store solar heat harvested during the day for use in the evening hours and at night and significantly improve the building's grid efficiency."

X4S is well on time with its thinking. In early 2022, the team will build its House Demonstration Unit, i.e., a 1:1 model that will be created on site in Wuppertal, Germany, in collaboration with the Biberach-based educational center "Holzbau Baden-Württemberg." For this, the factory planning must be completed by the middle of this year, explains Simone Nitz. "Our schedule is tight, but realistic," says the architect and project manager, summarizing the current status. To organize the complex project, the team at Biberach University of Applied Sciences has set up an online-based project management tool. "This allows us to keep track of the entire project and the individual subtasks."

**Keywords:** extension for sustainability, sustainability, energy, climate protection, efficiency, student competition, sde21, interdisciplinary, Hochschule Biberach, Team X4S, urban development

## Press Release from Biberach University of Applied Sciences

November 24, 2020

### *Building extension*

### **Sustainable building: In search of new solutions in the urban context**

Café and residential building with garden, bicycle workshop and care offers in a house united: preferably carbon neutral, ecologically and socially lastingly. With this concept the student SDE21 team of the University of Applied Sciences Biberach (HBC) wants to compete in the international student competition Solar Decathlon Europe 21. The X4S (Extension for Sustainability) team is led by Prof. Andreas Gerber, Professor of Building Physics and Climate-Responsible Construction, and Lena Frühschütz, Master's student of Energy and Building Systems. The Biberach team is fully committed to sustainability in its contribution to the project and is implementing this by planning a multi-storey extension to the Café Ada building in the middle of Wuppertal. Not only the result is community-oriented, but also the way to get there. The further the project progresses, the more it develops into an interdisciplinary joint project of HBC.

In the competition entry, the Café Ada, which is located in the Mirker Quartier in Wuppertal, is to be extended by four floors. In concrete terms, this means that the total usable space will increase fivefold. To ensure that the solid wood construction fits perfectly into its surroundings, part of the team made an excursion to Wuppertal in September and set their sights on the quarter and the building. The project is challenging, because "the current standard is extensions with a maximum of one or two storeys; a four-story extension is rather unusual and requires new solutions in many fields," says Lena Frühschütz, describing the special feature. A sticking point for the team: fire protection. Together with the fire protection planning office Sinfiro, based in Balingen, X4S is currently working on an innovative fire protection concept that combines safety and sustainability - "human life is of course always in the foreground," says Frühschütz. In a three-part lecture series of the planning office, teachers and students "experienced how to approach fire protection in a solution-oriented way. Prof. Gerber is enthusiastic about the benefits and solutions that

participation in SDE21 brings - for the entire university. But the innovative approaches to fire protection are also of particular interest to experts from the field who are curiously following the ideas. The further the project progresses, the clearer the complexity and interdisciplinary nature of the project becomes. This is also reflected in HBC's course offerings: More and more courses are thematically dedicated to the project and support the X4S team in sustainable construction and innovation.

For example, in the course "Art and Design", architecture students deal with the conception of furniture made of sustainable and recyclable materials. The aim is to conserve resources, save costs through self-construction and create a healthy indoor climate for the residents. "The furniture industry has unfortunately developed in many areas to the point where furniture is no longer designed for timelessness in terms of both design and functionality. Instead, this industry, like many others, has become very short-lived," describes architecture student Anna Diemer, who wants to counteract this trend by taking part in the course. The students work mainly with the materials wood, bioplastics and mycelium (thread-like cells of a fungus) and develop models for tables, chairs, shelves, sofas, etc. that are easy to assemble, comfortable to use and completely recyclable.

For the student, the mushroom mycelium is "a completely new impulse. It is the fibre mesh in the floor from which mushrooms sprout. Combined with different natural raw materials and waste, such as coffee to go paper cups, the mycelium can be cultivated. The mass is pressed into a mould and after a few weeks the "ingredients" are not only dried but also grow together - a robust material from which tabletops, chairs but also lampshades can be made. The great advantage of mycelium is that after use it can be returned to nature without the use of energy and is completely compostable. It offers a wide range of applications and represents an alternative that can help to save raw materials and make the planet more sustainable. The Planet and Café Ada in Wuppertal.

**Keywords:** extension for sustainability, sustainability, energy, student competition, sde21, interdisciplinary, Hochschule Biberach, Team X4S, climate-responsible

## Press Release from Biberach University of Applied Sciences

August 25, 2020

### *Sustainable urban development*

### **Mayor of Biberach supports the university's SDE-21 team: "We need people like you here in Biberach"**

What should our city look like in 20 years? How can we reconcile the need for housing and public buildings with the challenge of climate protection and sustainable urban development? For the Lord Mayor of Biberach, Norbert Zeidler, these questions are extremely important and unavoidable. Especially the topic of sustainable building and living in the city plays a major role for the mayor. A project team from the University of Applied Sciences Biberach (HBC) is also currently working intensively on solutions. They address questions such as how we can create cities that are worth living in and fit for the future together, offering sustainable, energy-efficient and socially acceptable buildings for living and working.

The interdisciplinary team, Extension for Sustainability (X4S) at HBC, is taking part in the international student competition "Solar Decathlon Europe 21" (sde21) and competes against 17 other teams from eleven countries. The HBC group is headed by Prof. Andreas Gerber, Professor of Climate-Responsible Building, and Lena Frühschütz, Master's student of Energy and Building Systems at HBC. All participants develop designs for innovative living and put them into practice in the form of fully functional, one- to two-story residential buildings. The team from Biberach University of Applied Sciences is planning a four-storey addition to an existing building in Wuppertal. Especially with regard to the development of our cities, this project idea can have an impact on a more sustainable future: "I think and hope that our project will have a major impact on the cities of the future. In order to achieve the climate protection plan's objectives in 2050, it is essential to shift the focus from new buildings to existing buildings," says Lena Frühschütz. With increasing urbanization, it will become more and more important to offer more living space in the city center. With its contribution, Team X4S wants to show that urban re-densification is an added value for all parties involved. Efficient and sustainable

building without gentrification, high living comfort through the use of ecological building materials, innovative neighborhood concepts and participation models are just some of the possible solutions

As in the Olympic decathlon, the SDE teams compete in ten disciplines. As a former decathlete, Lord Mayor Zeidler is familiar with this challenge: "In decathlon, being strong in just one or two disciplines is not enough for a victory or even a good performance. On the contrary, you have to be an all-rounder". For this demanding task, the head of the city wishes the X4S team every success via video message and is very proud of their participation in the competition: "We need brains like you here in Biberach. And, by the way, in the rest of the world as well."

**Keywords:** extension for sustainability, sustainability, energy, climate protection, efficiency, student competition, sde21, interdisciplinary, Hochschule Biberach, Team X4S, urban development

## Press Release from Biberach University of Applied Sciences

August 10, 2020

### *Ecological footprint*

### **Survey shows: In things vacation goes the lastingness thought on journeys**

Team X4S, Extension for Sustainability, of Biberach University of Applied Sciences (HBC), which is participating in the international student competition Solar Decathlon Europe 21, is fully committed to sustainability. But how do the team members' fellow students feel about the idea of sustainability? HBC students wanted to know: "How important is sustainability to you?" and conducted a survey at the university.

The answers of the more than 160 participants from all courses of study show that the students are definitely concerned with the topic. For example, two-thirds of those surveyed pay attention to sustainable products for everyday use and are prepared to spend more money on these consumer goods. "The only thing that seems to be out of touch with the idea of sustainability is when it comes to vacations," Nick Sommer and Markus König sum up the results at this point. The architecture students developed, conducted and evaluated the survey together with six students. "Only 43 percent of those questioned paid attention to an ecological footprint on vacation and are willing to spend more money on this," Sommer cites the concrete figures.

The interdisciplinary X4S project team - which includes energy and construction engineers, project managers and architects - is jointly developing a contribution to sustainable neighborhood development in urban areas. They have chosen a comprehensive approach for this: "We not only want to develop ideas for carbon neutral living and housing, but also to raise awareness the population to ecological issues," says Lena Frühschütz, head of the competition team. She sees this as an educational mission for universities, which HBC fulfills in a dual sense. On the one hand through its fields of activity in teaching, research and transfer. But also through its concrete participation in the Solar Decathlon Europe 21: "We want to involve the citizens and provide them with the information in a targeted manner".

From the survey results, the team therefore wants to derive indications of where is a specific need for action. The results show that there is a fundamental understanding of ecology, economy and social issues, says Frükschütz, who, in addition to her work as project manager, is a student in the Master's program in Building and Energy Systems at HBC. The feedback, however, also shows a lack of willingness to forego comfort in favor of environmental protection. "A rethink is still needed here, demands the studied civil engineer.

For example, the survey revealed that although two-thirds regard the balance between the use and regeneration of resources as the most important pillar of sustainability. Only one in five considers the need for efficiency and only about one in seven considers low resource consumption to be a central task. "These data show that the path to greater sustainability is complex," says Lena Frükschütz.

Not only for the sde21 project, she said, we have to generate energy regeneratively, use it efficiently and recover wherever possible. "This is precisely one of the core competencies of Biberach University of Applied Sciences," says Professor Andreas Gerber from the Energy Engineering course, who is leading the interdisciplinary project together with Lena Frükschütz. "With our competition entry, we want to show that sustainability and climate protection as well as affordable living space and a city worth living are not mutually exclusive," says the expert for climate-friendly construction and energy concepts.

**Keywords:** extension for sustainability, sustainability, energy, climate protection, efficiency, student competition, sde21, interdisciplinary, Hochschule Biberach, Team X4S

## Press Release from Biberach University of Applied Sciences

July 7, 2020

### *Student competition*

### **SDE21 moved: HBC team sees opportunities for increased interdisciplinary cooperation**

The Solar Decathlon Europe 21 competition in Wuppertal is postponed. This is the organization team's reaction to the current COVID-19 pandemic. The main event of the international university competition was originally scheduled for September 2021. The University of Applied Sciences Biberach (HBC) will also take part in the competition with its X4S (Extension for Sustainability) team.

As announced by the German organization team, the decision was made in close coordination with the participating teams and the cooperation partners. "A major event with 18 teams from eleven countries and a high visitor turnout would possibly encounter more difficult conditions in 2021. What forces us to postpone the event, however, is above all the fact that the teams are currently severely impaired in their work". The quantity and quality of the entries would be in question at the originally planned date, reports project manager Dr. Daniel Lorberg.

"The schedule of SDE21 is tight. In just under two years, the teams have to design entire buildings and construct a residential unit from them in Wuppertal", emphasizes Dr.-Ing. Katharina Simon, Project Director for Architecture and Urban Innovation: "The postponement and the time buffer gained as a result continue to guarantee fair competitive conditions". The scientific research accompanying the Solar Decathlon Europe 21 is also currently not feasible due to Corona. "SDE21 is not about putting up any houses on the site with difficulty, but about finding real answers for the city of the future. This is exactly what we are creating the conditions for with the shift," Lorberg sums it up. "We are looking forward to a great event in the summer of 2022, which is all about sustainable living and living in the city of tomorrow. Especially in times like these, feasible, innovative solutions for existing challenges are in demand," concludes Simon.

The project managers at Biberach University of Applied Sciences - Professor Andreas Gerber (Dean of Energy Engineering) and Lena Frühschütz from the Institute for Building and Energy Systems also see the postponement as an opportunity: "The project extension gives us the opportunity to work more intensively on some topics and, above all, to strengthen interdisciplinary cooperation". The Biberach team is composed of students, professors and staff from all fields of construction studies, such as energy and civil engineering, project management and architecture. The team's goal is to contribute to the smart and sustainable addition of a new building to the existing urban stock in order to reconcile the need for living space with the challenge of climate protection. The 73-member group is currently working on the tasks of structural analysis and building design.

**Keywords:** extension for sustainability, sustainability, energy, climate protection, student competition, sde21, interdisciplinary, Hochschule Biberach, Team X4S, urban

## Press Release from Biberach University of Applied Sciences

March 23, 2020

### Interdisciplinary Challenge for all Construction Degree Programs

Biberach University of Applied Sciences (HBC) is participating in the international “Solar Decathlon Europe 21” competition and developing ideas for innovative housing development.

The HBC team has already completed the first step: In December 2019 a panel of experts nominated HBC for the student competition Solar Decathlon Europe 21 (sde21), focusing on the construction of sustainable, energy-efficient buildings. Project Manager Lena Frühschütz heads up the highly motivated, interdisciplinary group, which has been hard at work on planning and realizing the concept ever since its nomination. The master’s student studying Energy Engineering and Professor Andreas Gerber are responsible for coordinating the 40-person team from Biberach. “We have a tight schedule,” says the Dean of Studies. This is why the project is now in full swing: The students from the Architecture Degree Program are working diligently on blueprints, while aspiring Energy Engineering students are developing the construction physics and energy design concept. Although the coronavirus pandemic has changed the conditions for the project overall – lectures at all universities in the country have been called off until 20 April – work on the project continues unabated: “We’re using digital tools and virtual meetings,” Lena Frühschütz explains.

The assignment for the competition is to develop and realize an idea for sustainable, energy-efficient and socially responsible construction in urban environments. This includes Architects, Energy Engineers and Construction Project Managers from HBC – all specialized fields of construction covered by the university’s degree programs. University Director André Bleicher believes the task reflects the transformation – in this case in sustainable urban planning – that is needed to solve the challenges of the future. “Everyone involved is welcome to contribute their knowledge and ideas – this makes the competition a transfer project for education, research and practice.”

University Council Chairman Gerd Leipold also sees participation in the event as an interdisciplinary challenge. The former head of Greenpeace International feels HBC is ideally equipped for the task of constructing a smart, sustainable building in an urban setting: “We don’t just teach sustainable planning and construction at the university. We

also develop new scientific methods, for example in the Research Institutes for Building and Energy Systems or Timber Construction.”

### *Intelligent building extension*

Project Manager Frühschütz notes that the project requirements and schedule are very demanding: “We still have a year and a half to plan and realize our building.” The project title “Extension for Sustainability” (“X4S”) is aimed at adding on to an existing, two-story building. “Of course, we won’t disclose our specific solutions approaches for implementing a CO<sub>2</sub>-neutral extension just yet. The competition is fierce and certainly never sleeps,” the master’s student says with a wink.

The impact the project will have on the university’s networking efforts is another key topic for the team. They added that the competition was a welcome opportunity to demonstrate the university’s performance capability to its partners,” says University President Thomas Schwäble: “The collaboration between the university, local tradespeople, small and medium-sized businesses, industry and associations creates added value for everyone involved.”

### *Coordinating, organizing and planning*

The project group is simultaneously learning the ropes, visiting conferences such as the one for energy-independent communities, which took place in Freiburg this February, exchanging ideas with experts from a range of fields, creating interdisciplinary lectures for the upcoming semester and coordinating the necessary project work.

“Interdisciplinary collaboration at the university must be absolutely seamless,” Lena Frühschütz explains. The awarding authority, the Energy Endeavour Foundation, has a list of specifications that requires progress be made, documented and published at certain milestones.

The first team workshop in Wuppertal is planned for early April. Due to the coronavirus outbreak, it will be conducted virtually.

## **Solar Decathlon Europe 21**

This is the first time the Solar Decathlon Europe 21 (sde21) competition will take place in Germany. The project team at the University of Wuppertal (BUW) includes the City of Wuppertal, the Wuppertal Institute for Climate, Environment and Energy, the Utopiastadt Initiative, the Wuppertal Municipal Utilities and Neue Effizienz GmbH. This is also the first time the building and energy competition will focus on the energy transition in an urban context. In August 2021 a panel of experts will make their decision on the submitted drafts. sde21 is sponsored by the Federal Ministry for Economic Affairs and Energy (BMWi).

<https://solardecathlon.eu/>

## **Additional voices on the subject**

The interdisciplinary challenge the competition offers is “extremely welcome”, says University President Thomas Schwäble:

### President Schwäble Interdisciplinary – 10 sec

A lot of exciting work, especially for coordinator and master's student Lena Frühschütz. Right now, organization and motivation are key:

Student Frühschütz Team building – 21 sec

The competition never sleeps; six German universities are among the 18 participants, which also include other European universities and three from Asia. Some of them are more experienced:

Professor Gerber Fierce competition – 12 sec

So competition will be fierce. This is why HBC is focusing on the path to getting there and not the outcome, says Andreas Gerber:

Professor Gerber The path to getting there – 20 sec