



# Timber Construction Award

## solar decathlon europe 21»22

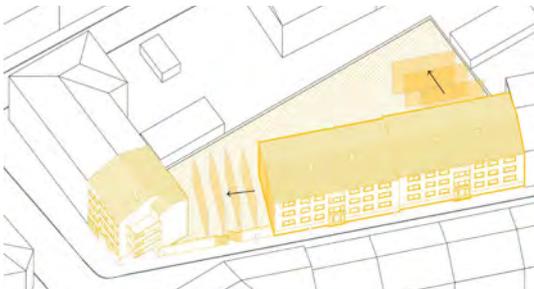
Out of competition award

## Solar Decathlon 21»22

### **Out of competition award**

Climate change is the greatest challenge today. How we use energy, raw materials and land will determine how we live in ten, thirty or fifty years. In this pressing challenge, which confronts humanity with existential questions, the question of sustainable building and living is of central importance.

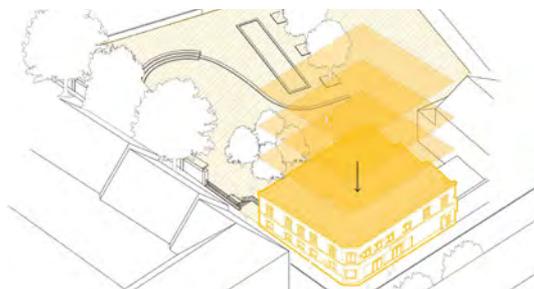
The fact that this situation has been known worldwide for decades is also shown by the initiative of the American Department of Energy in 2002, when the 'Solar Decathlon' took place for the first time, an architectural and energy technology competition for university teams from all over the world. Students of architecture, civil engineering and related disciplines were asked to develop ideas for a future worth living and to compete internationally with like-minded people.



**Figure 1**  
Construction task 1:  
Refurbishment and  
extension in Wuppertal



**Figure 2**  
Construction task 2:  
Construction gap  
in Wuppertal



**Figure 3**  
Construction task 3:  
Refurbishment and extension  
in Wuppertal

## timber construction award



To date, the goal of this competition is the design and realization of a highly efficient building that covers its energy needs only with self-produced solar energy. The ambitious buildings are assessed by independent expert juries according to ten criteria – from architecture to energy performance and innovation to urban mobility. In 2007, a German team won these demanding procedures for the first time. At that time, students from the Technical University of Darmstadt convinced the jury with an innovative plus-energy house in timber frame construction. In 2008, the 'Solar Decathlon Europe' was also created as a European version of the competition, the results were presented in Madrid. Since then, the European and American decathlons have been held every two years in alternation.

In 2022, Germany became the inviting nation for the European 'Solar Decathlon' for the first time. The venue was the city of Wuppertal in North Rhine-Westphalia, an exciting place that still bears striking traces of industrialization. While the focus of the 'Solar Decathlon' has so far been on the use of renewable energies and new buildings, this was the first time that the urban reality of inhabited real estate was to be explored. The goal: to develop technical, architectural and social solutions for the European cities of tomorrow.

Cities have a particularly key role to play in climate protection. According to United Nations forecasts, 60 percent of the world's population will live in urban areas as early as 2030. Our cities have the greatest potential for climate protection strategies. Unlike in Asia and Africa, where the greatest urban growth will take place in the coming decades, cities in industrialized countries like Germany are largely built. There is an urgent need for action here to optimize existing urban structures and raise awareness for sustainable building and renovation.

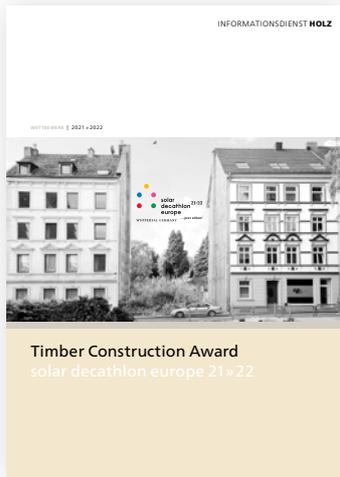
In Wuppertal, 18 university teams from eleven countries competed against each other under the guidance of Bergische Universität. They developed concepts for innovative and sustainable living based on concrete building tasks in this city or in their home countries. They transformed these ideas with their own hands into fully functional demonstration buildings on a scale of 1:1 on a former industrial site in the center of the city and presented them to the public there.

The positive spirit of the 'Solar Decathlon', which started 20 years ago, has attracted worldwide interest from the very beginning, not only from students at universities or building professionals, but also from the general public. Most importantly, all competitions have produced inspiring and practical ideas.



**Figure 4**  
Winner SDE 2007  
TU Darmstadt

## Timber Construction Award



**Figure 5**  
Announcement

### Out of competition award of the German Timber Construction

Most of the university teams in the 'Solar Decathlon' are using wood as a building material because it always meets the competition's high standards for architecture, energy balance and sustainability, and it is convenient for them in terms of transport – sometimes from overseas - and assembly of their prototypes.

For this reason, seven organizations from the timber and forestry industry representing German timber construction decided to call for the 'Timber Construction Award', a out of competition award for innovative living and energy concepts using wood in addition to the main competition. For the first time, all entries were to be presented to a jury of experts who not only assessed the overall concept, but also specifically the timber construction. This jury had the task of examining the technical and design qualities of the timber constructions as well as the life cycle of the buildings in terms of energy efficiency, economic efficiency in operation and maintenance, and recyclability.

### The competition procedure

All university teams participating in the 'Solar Decathlon Europe 2022' were invited to participate. 17 teams took part in the two-stage procedure of the 'Timber Construction Award'. On June 19th, an international jury of architects and engineers with experience in timber construction was at the center of the competition, evaluating a pre-screened selection of eight projects on site at the competition site in Wuppertal. The university teams were challenged to present their work on the demonstration building and to answer the jury's expert questions.

### First Jury

Three timber construction experts examined all 17 entries submitted. They determined a shortlist of eight works for the final round within two online sessions.

### Jury chairman:

Prof. Dipl.-Ing. Arch. Christian Schlüter,  
Wuppertal (D)

Dipl.-Ing. Ralf Harder,  
Studiengemeinschaft Holzleimbau,  
Wuppertal (D)

Dipl.-Ing. Michael Keller,  
Informationsdienst Holz,  
Aichach (D)

**Figure 6**

Jury meeting



**Figure 7**



**Figure 8**

Property visits



### **Second Jury**

The meeting of the main jury took place at the competition site. It received a detailed report on the work of the First Jury. On the basis of this shortlist, an inspection of the eight demonstration buildings followed with individual presentations by the university teams. This was followed by a non-public decision-making session to determine the winners.

#### **Jury chairman:**

Dipl.-Ing. Arch. Andrew Waugh,  
Waugh Thistleton Architects, London (GB)

Dipl.-Ing. Tobias Götz,  
Pirmin Jung Deutschland, Remagen (D)

Dipl.-Ing. Ralf Harder,  
Studiengemeinschaft Holzleimbau,  
Wuppertal (D)

Dipl.-Ing. Arch. Bettina Horsch,  
Ecole Nationale Supérieure D'Architecture,  
Nantes (F)

Dipl.-Ing. Michael Keller,  
Informationsdienst Holz, Aichach (D)



**Figure 9**

## The participants \_ Shortlist

### Team 'coLLab'

Stuttgart University of Applied Sciences,  
Germany

Figure 10a and b



### Team 'C-Hive'

Chalmers  
University of  
Technology,  
Sweden

Figure 11a and b



### Team 'levelup'

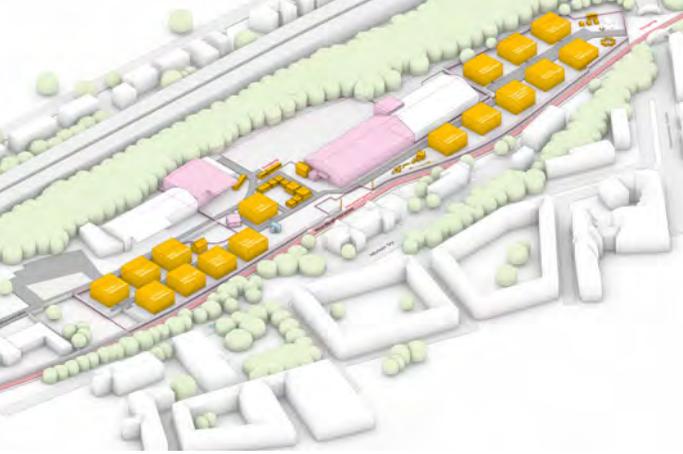
Rosenheim  
Technical University  
of Applied Sciences,  
Germany

Figure 12a and b

### Team 'EFdeN'

University for Architecture  
and Urban Planning 'Ion Mincu'  
Bucharest, Romania

Figure 13a and b



**Team 'MIMO'**  
Hochschule  
Düsseldorf,  
University of  
Applied Sciences,  
Germany  
**Figure 14a and b**



**Team 'RoofKIT'**  
Karlsruhe Institute of Technology (KIT),  
Germany  
**Figure 15a and b**



**Team 'SUM'**  
Delft University of Technology,  
Netherlands  
**Figure 16a and b**



**Team 'x4s'**  
Biberach – University of Applied Sciences,  
Germany  
**Figure 17a and b**

## 1\_Prize Team 'RoofKIT'

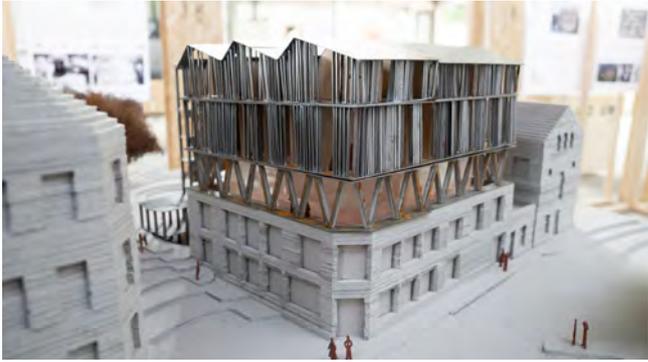
Karlsruhe Institute of Technology (KIT),  
Germany

### Appreciation of the jury

The 1st prize of the 'Timber Construction Award 2022' goes to the design for an extension by the team 'Roofkit' of the Karlsruhe Institute of Technology. The design is based on the concept of the city as a social factory, urban raw material store and sustainable energy producer. The central design principles of the project are based on the various criteria of sustainability.

Figure 18 – 25

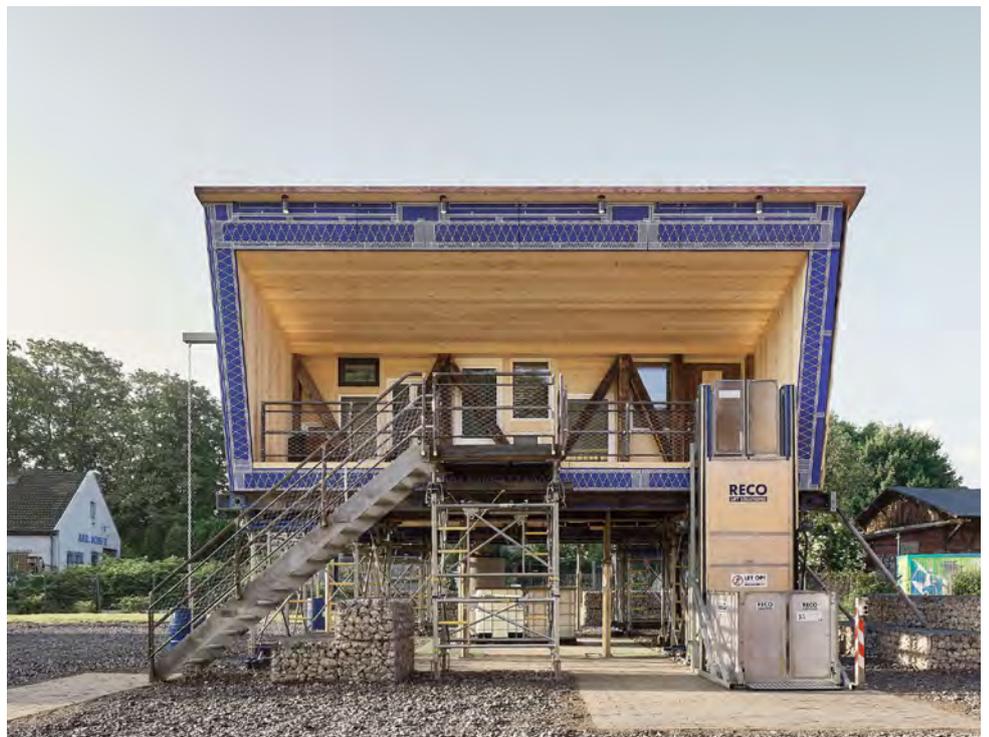




**Figure 26 und 27**  
Model and rendering  
of the overall project

With regard to the ecological criteria, the team aimed to use 100 per cent renewable energy for the building. This is done primarily through closed-loop systems in which building residues such as organic waste and sewage are used to generate energy and heat. This kind of closed-loop thinking is also redeemed in the timber construction: all connections are detachable, without the use of adhesives or composite materials.

The jury was convinced by a perfectly planned supporting structure with extremely material-saving wall and ceiling structures. The construction was realised with prefabricated timber modules using solid wood in combination with sustainable materials for the finishing. The flexibility of the modular floor plan, which allows maximum use of space, deserves special mention.



## 2\_Prize Team 'coLLab'

**Stuttgart University of Applied Sciences,  
Germany**

### **Appreciation of the jury**

Another prototype for adding storey's was developed by the team 'coLLab' of the Stuttgart University of Applied Sciences, which is awarded a second prize. The stacking and refurbishment concept were developed for the university's own campus and creates space for student housing in the city center area. Because of the high potential for such additions in urban areas, it was ensured that the design could also be transferred to other buildings.

The basis of the 'coLLab' prototype is a constructive wooden grid – comparable to a skeleton construction – which rests on the respective existing structure. The interior spaces are characterized by so-called functional walls in which flexible furniture and the technical components are built in. For example, a kitchen, seating or a bed can be accommodated in these walls, which can be folded out, pulled out or pushed open as required.

The jury of the 'Timber Construction Award' was impressed by the very effective construction of the Stuttgart design as well as by the prefabrication considerations. In conjunction with the planning and structural engineering competence demonstrated, all questions about the scalability of the solution were also answered positively.



Figure 28 – 30

Figure 31 und 32  
Renderings of the overall design

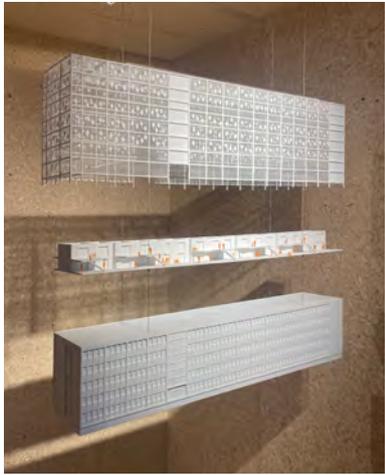
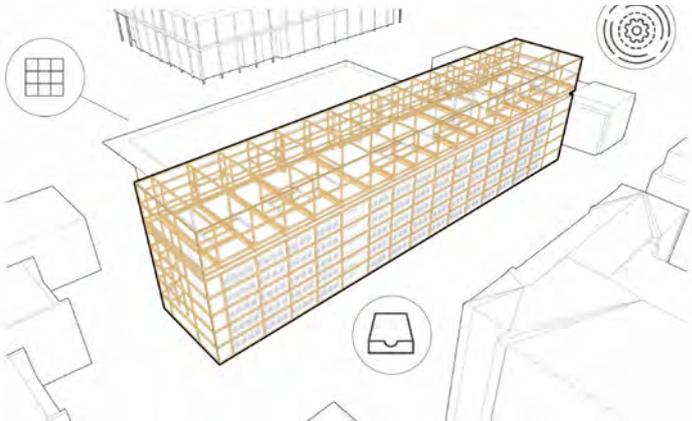


Figure 33–38

## 2\_Prize Team 'SUM'

Delft University of Technology,  
Netherlands



### Appreciation of the jury

Another second prize goes to the Dutch prototype of the team 'SUM' from the Delft University of Technology. It is used to modernize a housing project in the Bouwlust district of The Hague. The main objectives of the refurbishment are to improve the energy efficiency of the building and to adapt the floor plans to a contemporary lifestyle.

Figure 39  
Rendering of a potential extension

Figure 40 – 47



To increase energy efficiency, the existing windows will be replaced and the building will be provided with an insulation layer. On top of the existing building, a light-weight extension will be added, which will densify the neighborhood and serve as an energy station for the entire building. The prefabricated wooden modules that make up the two storey's of the extension can be combined with each other to form different types of flats.

The residential units are equipped with flexible furniture to make the best use of the space. Photovoltaic modules on the roof and a building-integrated solar façade supply the entire building with electricity and hot water. The jury was convinced by the very intensive consideration of the local boundary conditions as well as the industrial production planning with a material-saving construction system made of wood. The design shows a convincing path to the future of building in the area of additions and renovations.

## Special Award \_ Resource-Saving Building

**Team EFdeN**  
**University for Architecture**  
**and Urban Planning 'Ion Mincu'**  
**Bucharest, Romania**

Figure 48 – 50



### Appreciation of the jury

A special prize for resource-saving construction was awarded to the 'EFdeN' team from the University of Architecture and Urban Planning in Bucharest, which developed a timber construction adapted to regional requirements using simple means. By using used plywood for the construction and interior fittings as well as the simplest, visible fasteners, the team demonstrated a convincing building even under difficult boundary conditions.



Figure 51

Figure 52 and 53



Figure 54 and 55  
Renderings of  
the entire project

After the jury meeting, the award ceremony of the 'Timber Construction Award' took place on the same day at the competition site. The exhibition of the demonstration buildings was also open to the interested public, so that on the evening of 19 June 2022 a large audience attended the award ceremony in addition to the university teams.

Timber construction pioneer Andrew Waugh from London, chairman of the jury, set the mood for the day's theme with a keynote speech. As one of the world's leading architects of urban timber construction, he forcefully pointed out the need for resource-conserving construction with renewable materials. Afterwards, the prizes were awarded to the teams from Germany, the Netherlands and Romania.

At the 'Solar Decathlon' in Wuppertal, all university teams from ten countries demonstrated how to close gaps between buildings, add storey's to buildings or renovate aging buildings in a climate-friendly and cost-effective way. With freedom of choice for urban building tasks, it was striking that all the prize-winning entries and many others in the competition were dedicated to adding storey's to existing buildings. This urban task is obviously found all over the world and is particularly suitable for exploiting the potential of wood as a lightweight building material.

The competition profile for existing buildings developed by the Bergische Universität Wuppertal as organizer proved to be a clever continuation of the initial theme of the 'Solar Decathlon'. How should building, housing and living in urban areas function in the future? The answer to this question attracted more than 115,000 international visitors to the exhibition grounds in the center of Wuppertal over twelve days.

Figure 56



Figure 57



Figure 58



# The Award Ceremony



Figure 59



Figure 65– 67

# Impressions



Figure 68 – 75



Figure 76

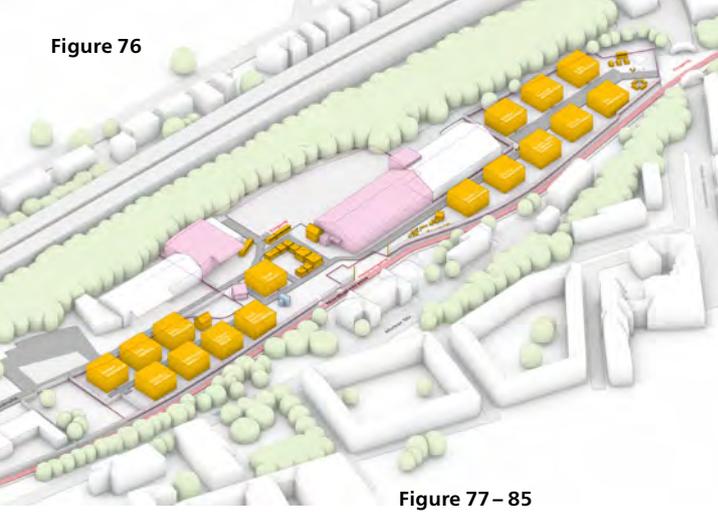


Figure 77 – 85



## Further information about the 'Solar Decathlon' and 'Timber Construction Award'

[www.sde21.eu](http://www.sde21.eu)

[en.wikipedia.org/wiki/Solar\\_Decathlon](https://en.wikipedia.org/wiki/Solar_Decathlon)

## Awarding Organisations

### 'Timber Construction Award 2022':

- Bundesverband Deutscher Fertigbau e.V., Bad Honnef
- Holzbau Deutschland – Bund Deutscher Zimmermeister im ZDB e.V., Berlin
- Holzbau Deutschland – Leistungspartner, Berlin
- Informationsverein Holz e.V., Düsseldorf
- Wald und Holz NRW, Münster
- Studiengemeinschaft Holzleimbau e.V., Wuppertal
- Überwachungsgemeinschaft Konstruktionsvollholz e.V., Wuppertal



Landesbetrieb Wald und Holz  
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