

BauBuche Beech laminated veneer lumber

Posts



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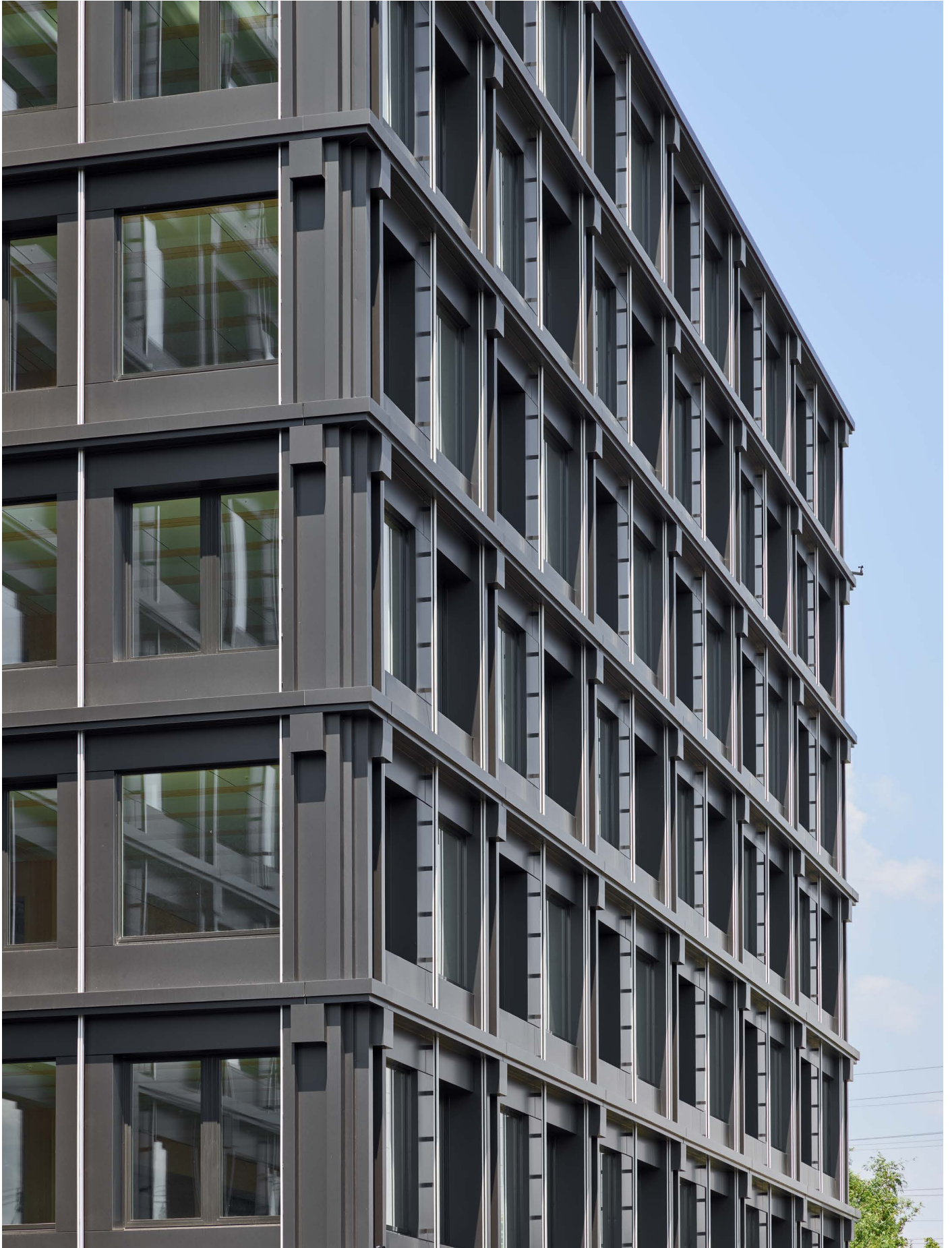
The economical and ecological alternative to reinforced concrete



Fig. 1: Artist's impression of Suurstoffi 22 Risch Rotkreuz, Switzerland (source: Burkard Meyer Architekten BSA)

Hardwood laminated veneer lumber – known as BauBuche – enables proprietors, architects and other decision-makers to construct buildings using slim, material-efficient wood components.

Innovative resources such as BauBuche thus open up new possibilities in building construction. Only twenty years ago, the production of hardwood laminated veneer lumber was not yet economically viable. Today, modern production technologies enable manufacturers to produce such veneer lumber with excellent properties that offer many advantages over conventional building materials. With BauBuche, developers can erect sustainable buildings in a much more cost-efficient manner than has hitherto been possible.



First timber-built high-rise building in Switzerland, Risch The timber skeleton frame consists of posts and beams made from BauBuche. **Architects** Burkard Meyer Architekten BSA **Timber construction** Erne AG Holzbau **Structural engineers** MWV Bauingenieure AG

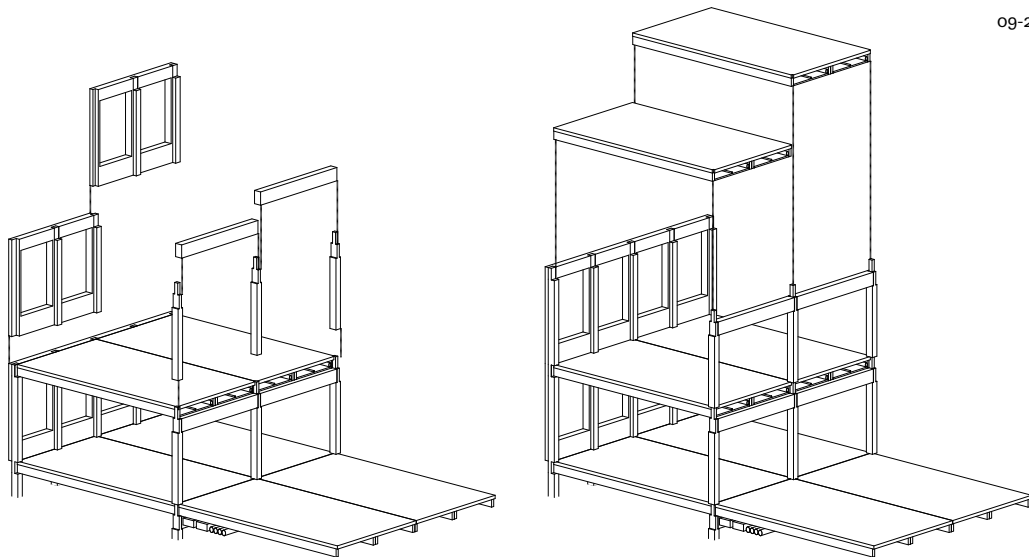


Fig. 2: Artist's impression of Suurstoffi 22 Risch Rotkreuz, Switzerland (source: Burkard Meyer Architekten BSA)

BauBuche is particularly suitable for floor-supporting posts. Thanks to the material's high load bearing capacity, such posts can be produced with smaller cross-sections than is possible with reinforced concrete¹. In addition, the dead weight of timber posts is only 33 % that of reinforced concrete posts. This helps reduce construction and transport costs, facilitates material handling and protects the environment through the use of a renewable resource harvested from a sustainably managed forests.

Comparison of BauBuche and reinforced concrete posts

Depending on the supporting grid, the number of storeys and the envisaged building use, posts must be able to carry substantial loads. In office and residential buildings, the characteristic compressive strength of BauBuche in grain direction is between 59.4 and 70 N/mm² and thus higher than that of C50/60 concrete².

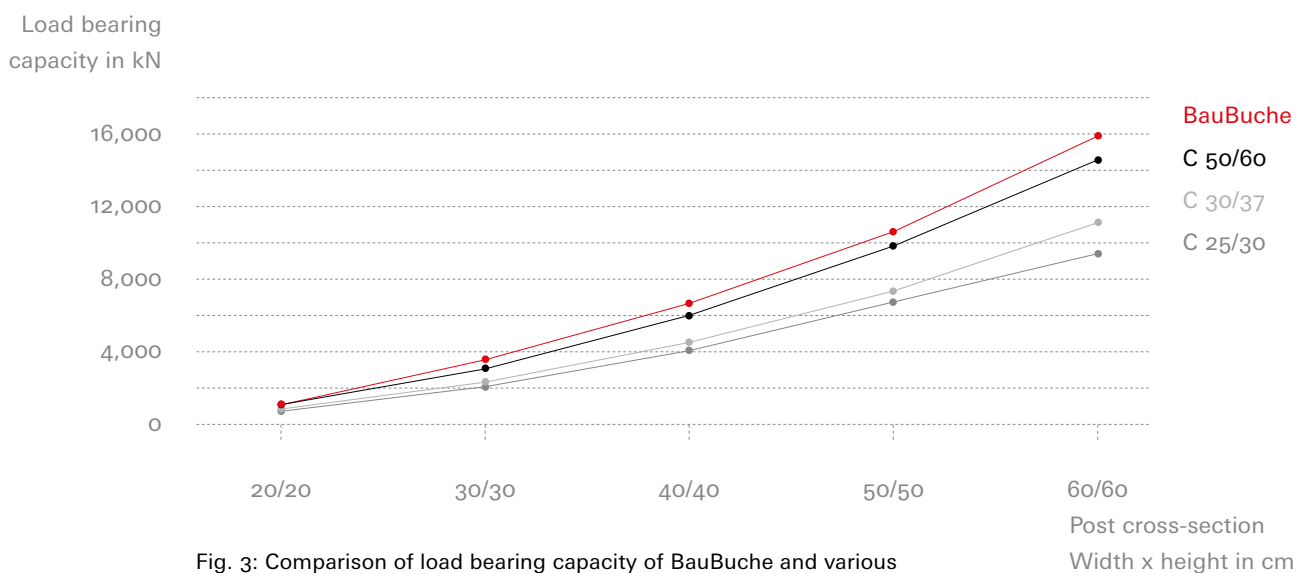


Fig. 3: Comparison of load bearing capacity of BauBuche and various concrete grades

¹ This statement applies to compressive loads applied to the centre of the post with an effective length of 3.05m and no specific fire safety requirements. The assumed degree of reinforcement of the reinforced concrete posts is 4 %.

² C50/60 denotes the compressive strength class of the concrete, whereby "C" stands for "concrete", "50" indicates the cylinder strength and "60" is the cube strength. The two strength values are in N/mm² and characterise the product.



The new office block of SR Bank in Stavanger (Norway) is built primarily in timber BauBuche was used for the posts at ground floor level and for many other building elements. Architects Helen & Hard Architects in cooperation with SAAHA architects Timber construction Moelven

The table below shows the cross-sections and weights of reinforced concrete posts compared with equivalent BauBuche posts. The figures are based on posts with a length of 3.05 m designed as hinged pillars. The designations "Ro", "R60" and "R90" indicate the duration of fire resistance (0, 60 and 90 minutes) prior to the post losing the necessary load bearing capacity.

Impact E_d in kN	Cross-section in cm		Cross-section in cm					
	R90	Weight in t	R30	Weight in t	R60	Weight in t	R90	Weight in t
C25/30 reinforced concrete			BauBuche					
680	20/20	0.30	20/20	0.10	24/24	0.15	28/28	0.20
2,140	30/30	0.69	28/28	0.20	28/28	0.20	32/32	0.27
4,120	40/40	1.22	36/36	0.34	36/36	0.34	36/36	0.34
6,750	50/50	1.91	44/44	0.50	44/44	0.50	44/44	0.50
9,400	60/60	2.75	48/48	0.60	48/48	0.60	48/48	0.60
C30/37 reinforced concrete			BauBuche					
680	20/20	0.30	20/20	0.10	24/24	0.15	28/28	0.20
2,340	30/30	0.69	28/28	0.20	28/28	0.20	32/32	0.27
4,520	40/40	1.22	36/36	0.34	36/36	0.34	40/40	0.41
7,350	50/50	1.91	44/44	0.50	44/44	0.50	44/44	0.50
11,110	60/60	2.75	52/52	0.70	52/52	0.70	52/52	0.70
C50/60 reinforced concrete			BauBuche					
900	20/20	0.30	20/20	0.10	24/24	0.15	32/32	0.27
3,130	30/30	0.69	32/32	0.27	32/32	0.27	36/36	0.34
6,020	40/40	1.22	40/40	0.41	40/40	0.41	40/40	0.41
9,820	50/50	1.91	48/48	0.60	52/52	0.70	52/52	0.70
14,530	60/60	2.75	60/60	0.93	60/60	0.93	60/60	0.93

The values illustrate that, from a post cross-section of 20/20 cm, the load bearing capacity of BauBuche posts matches or even exceeds that of reinforced concrete posts of the same dimensions. This is due to the high compressive strength of BauBuche.
From cross-sections of 40/40 cm, BauBuche posts can even replace equally sized C50/60 reinforced concrete posts with a fire resistance rating of 90 minutes.

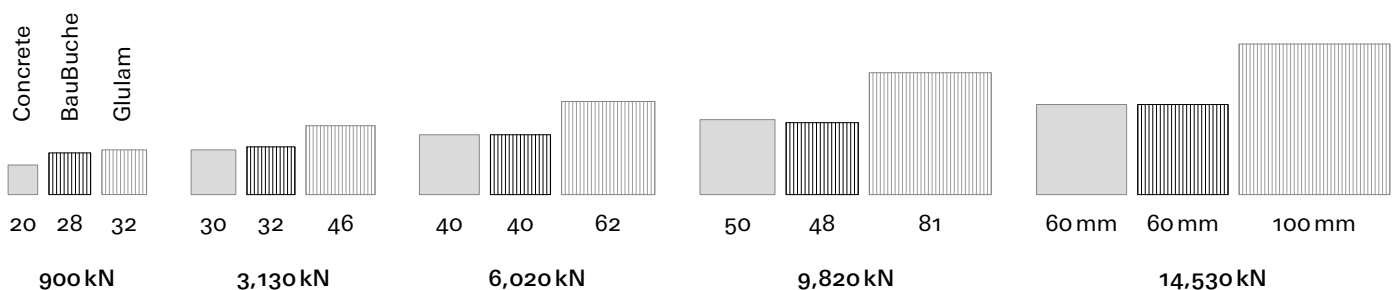


Skeleton frame made in BauBuche, Jena Forestry Office, Stadtroda Locally sourced timber was the material of choice for the construction of the local forestry office. **Architects** cornelsen + seelinger architekten BDA
Timber construction Grossmann Bau GmbH & Co. KG **Supporting structure planning** merz kley partner ZT GmbH

Comparison of BauBuche posts versus reinforced steel posts (C50/60) and glulam (GL24h)

Timber skeleton construction is a building method offering excellent resource efficiency. Thanks to its sustainability, it has gained enormously in popularity over the past few years. By opting for a BauBuche skeleton construction rather than spruce glulam posts, you can maximise the rentable floor space. This is of particular advantage in densely built metropolitan regions. The diagram below shows the savings in material that can be achieved with BauBuche as compared with reinforced concrete and glulam. The fire resistance duration of BauBuche posts is 90 minutes, assuming exposure to fire on four sides.

Comparison of cross-sections of posts made in C50/60 concrete, BauBuche and GL24h glulam (in mm²) for certain load bearing capacities



BauBuche posts – product range

All standard post dimensions for multi-storey buildings (cross-sections from 20 x 20 cm to 6 x 60 cm and lengths from 2.0 m to 18 m) are available in stock. Rectangular posts, and posts with cross-sections other than the above standard dimensions are available on request. Please note that the posts are available in height along a fixed scale (increments of 40 mm). For details, refer to the product overview (chapter 02 in our BauBuche brochures). To ensure on-time delivery, please contact the BauBuche team as early as possible during the planning stage.

Recycling

BauBuche can be re-used, or thermally recycled at temperatures from 850°C. BauBuche waste is classified as class A2 wood waste.

BauBuche posts – all advantages at a glance

- _ BauBuche is made from wood, a renewable resource, and stores biogenic carbon (see EPD-POL-20230326-IBA1-DE)
- _ Compressive strength equivalent to that of C50/60 concrete
- _ The same column cross-sections as those possible with C50/60 reinforced concrete are often achievable.
- _ Dead weight 66% less than that of reinforced concrete (*Calculated based on the assumed bulk densities in each case; this is not a comparison of complete components or structural systems.*)
- _ Construction with less material and higher resource efficiency thanks to smaller cross-sections than with softwood elements
- _ Larger useful floor space (compared with softwood construction), boosting rental income – especially in urban areas
- _ Excellent surface finish and quality



The high surface quality makes BauBuche ideal for exposed construction elements.

Top and bottom fasteners for hinged pillars

BauBuche posts can be easily secured to reinforced concrete or timber floors. The respective connecting points at the top and bottom of BauBuche posts are designed according to established solid construction standards.

Packaging and protection against moisture

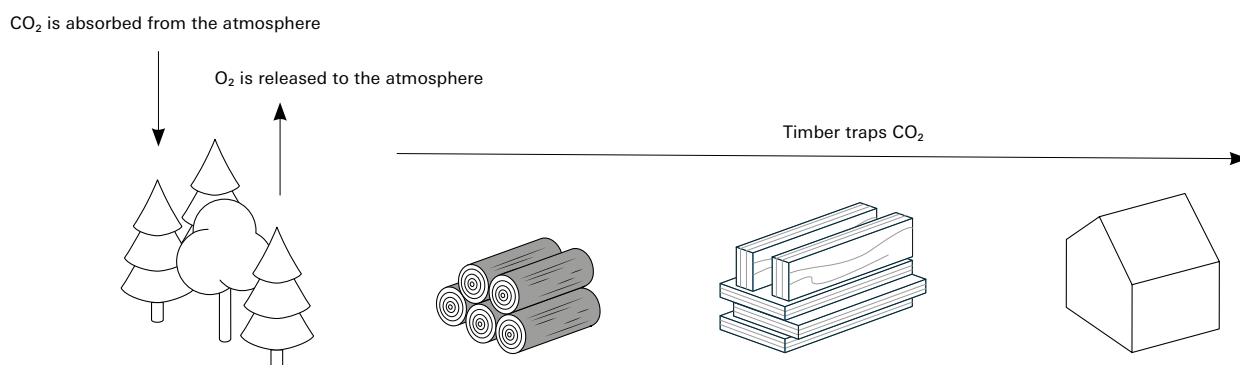
After machining, all BauBuche elements should be treated with a moisture barrier coating from Koch & Schulte that protects them against damage from water during transport and installation. For more information regarding machining, installation and available colours, see brochure 09. We also strongly recommend protecting the BauBuche elements against mechanical impact, humidity, etc., using suitable packaging material.

Fire safety

Timber construction elements have high fire safety ratings. This is due to the fact that the fire produces a charcoal layer on the outside of the timber element. This layer then acts as a fire barrier, protecting the core of the element against heat, preventing further combustion. After 90 minutes of fire, the load bearing capacity of 3.05 m BauBuche posts with a cross-section of $\geq 40/40$ cm is equivalent to that of concrete, even in the unlikely event of exposure to fire on all sides. BauBuche post are also a viable alternative to smaller concrete posts with cross-sections of 30x32 cm or 36x36 cm. Here, the BauBuche cross-sections are however slightly larger than those of the concrete posts. As BauBuche posts can be clad with firecheck boards, it is possible to opt for smaller cross-sections so as to avoid overdimensioning of the posts.

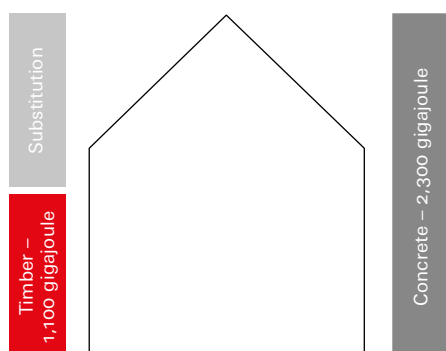
Timber construction is climate friendly

Timber is a renewable resource. Sustainable forestry management and harvesting, which in Germany is required by law since more than 300 years, benefit both humans and its surroundings. While we experience shortages in other construction materials, wood is growing all the time. All lumber processed by Pollmeier comes from sustainably managed forests and travels no more than 200 km from forest to sawmill. (Proof of Origin: DINC-PEFC-COC-000841 from 20.06.2023)



Timber is not only a renewable resource, but also a carbon sink. As CO₂ remains locked up inside the timber until it decomposes. With every cubic metre of timber in a building, we lock up approx. 1 ton of CO₂ for a long time. In addition, we reduce the energy input in the building, as the timber replaces construction materials such as concrete and steel that have a large carbon footprint. Wooden buildings therefore reduce CO₂ emissions in two ways.

Energy required to build four-storey building shell



Source: German Climate Action Plan 2050



River Beech Tower research project, Chicago Scientists explore the possibilities and limits of high-rise timber construction. **Collaboration project of Perkins + Will Architects, University of Cambridge and Thornton Tomasetti Engineers**

Rendering