

IPCC (Intergovernmental Panel on Climate Change), World Climate Report on 9th August 2021:

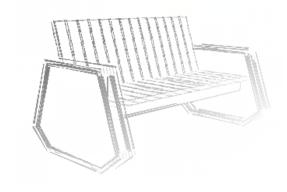
"Deliberate carbon dioxide removal (CDR) from the atmosphere has the potential to compensate for residual CO2 emissions to reach net zero CO2 emissions." Furniture as the basis for a second and third life of the material

This model project shows how medium-term CO2-storage (over 100 years) in products and material cycles already works today without social- and environmental risks.

**Picture this:** A hiking bench, that is like a field of wild flowers - beautiful for a lifetime, renewing itself independently, taking and storing carbon from the atmosphere, touching the senses and shaping the entire region.







The Weimarer Land stands for originality, authentic experiences, diversity of inspiration and development and is a source of ideas of renowned designers of past times until today. A uniform, attractive and sustainable terrain furniture on hiking and biking trails is to make this heritage architecturally tangible, to make the brand spatially more perceived and to transfer its identity into the future.

The tourism objective is to improve the comfort of visitors' stay and at the same time to relieve the municipal authorities of the care and maintenance of the site furniture. To this end, the Silva Bench and the Salaix Bicycle Racks were developed as prototypes, which will be realised with an edition of 100 each at selected waypoints throughout the Weimarer Land region by 2023/2024. Behind this is a well thoughtout design concept that combines aesthetics, sustainability and public utility - in the spirit of the New European Bauhaus.

# BENCH SILVA











PROJECT RELEVANT SDGS from the Tourism Strategy 2030 of the Weimarer Land e.V.



# A regional model project according to all principles of the New European Bauhaus.

New

European

Bauhaus

The interdisciplinary connection of aesthetics and metaphysics, art and craft, industry and nature, society and architecture is the intention of the Bauhaus, which lives on worldwide to this day. The New European Bauhaus, as a project of the European Union, picks up where the Bauhaus idea left off in order to generate new approaches to solutions for the European Green Deal and the associated turning point towards a decarbonised and sustainable economy and society.

Even 100 years ago, the Weimarer Land was considered a source of inspiration and a place of activity for the Bauhaus masters and masterminds of the time. With the site furniture, we want to enrich the cultural and creative dimension of the New European Bauhaus to show how sustainable innovations can be made tangible in public space in an exemplary way and how positive visions of the future can be placed in everyday society. The brand-defining site furniture combine beauty with sustainable circular design for the municipal sector, taking the EU's New European Bauhaus initiative back to the origins of the original. In doing so, we are guided by all four key themes of the New European Bauhaus:

- Reconnecting with nature
- Regaining a sense of belonging

Prioritising the places and people that need it most

• Fostering long term, lifecycle and integrated thinking in the industrial ecosystem



# The Weimar Land - place of inspiration of great minds, from Goethe and Coudray to Feininger and Gropius.



## Aesthetics, which stimulate the spirit.

The design of the terrain furniture reflects the brand identity and captivates with its conciseness. The designers' idea is a design-oriented effect compared to classic, very rustic-looking wooden benches and hiking rest areas. Functionality, haptics and appearance are closely oriented to the brand character of the Weimarer Land.

This increases the experience factor, enhances recognition in Thuringia and thus shapes the brand's regional setting.

The form-giving design element is the hexagon from the brand design, which symbolises natural balance, diverse compatibility and open scope for development. At the same time, the shape reflects the reduction to a closed material flow.

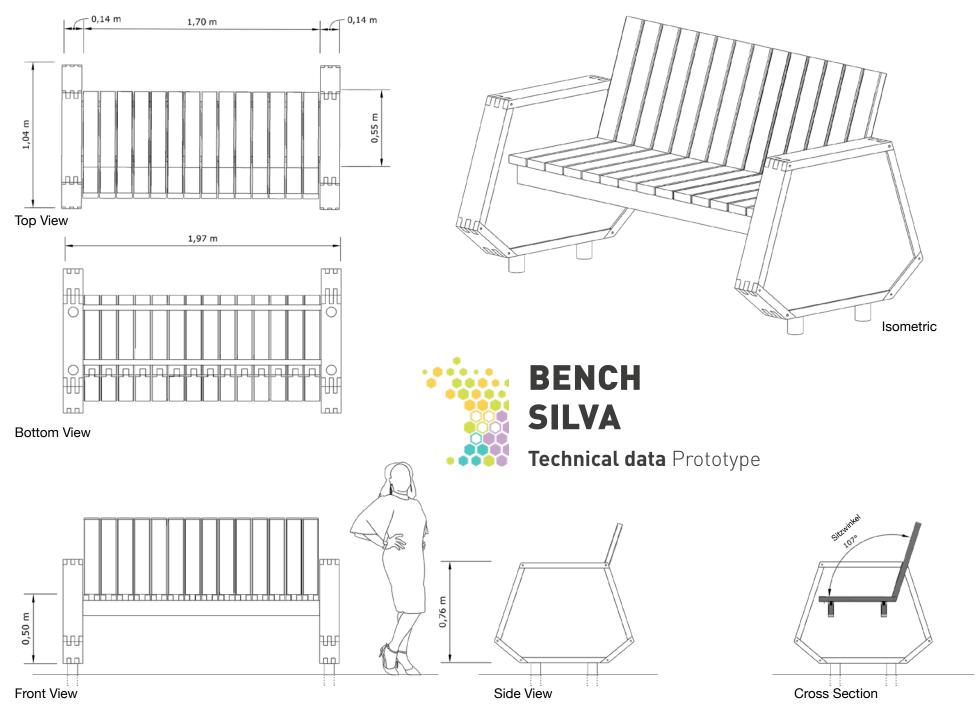


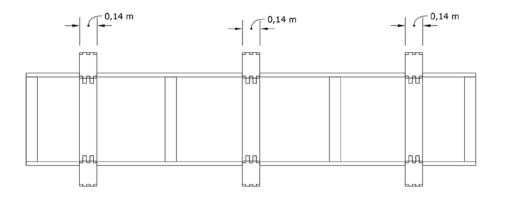




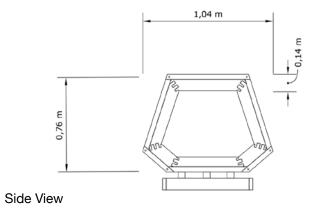


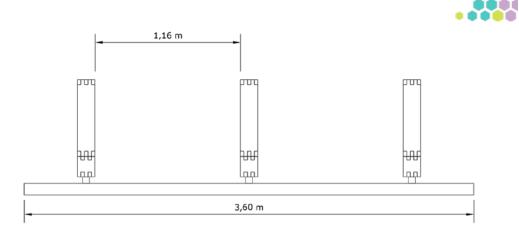


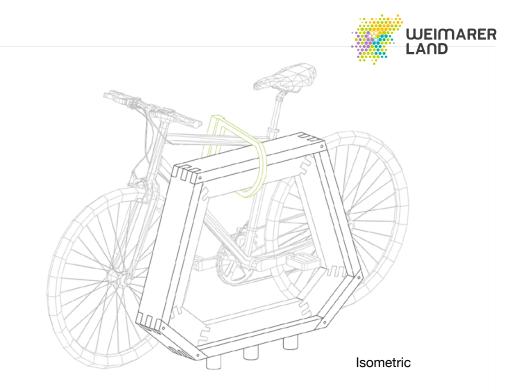












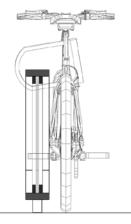
### SALAIX BICYCLE RACKS

Technical data Prototype

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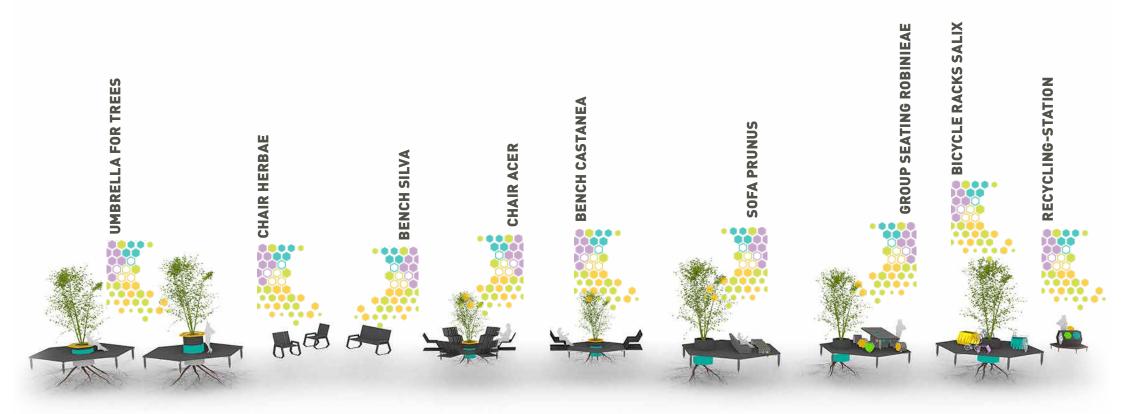
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Isometric

Cross Section

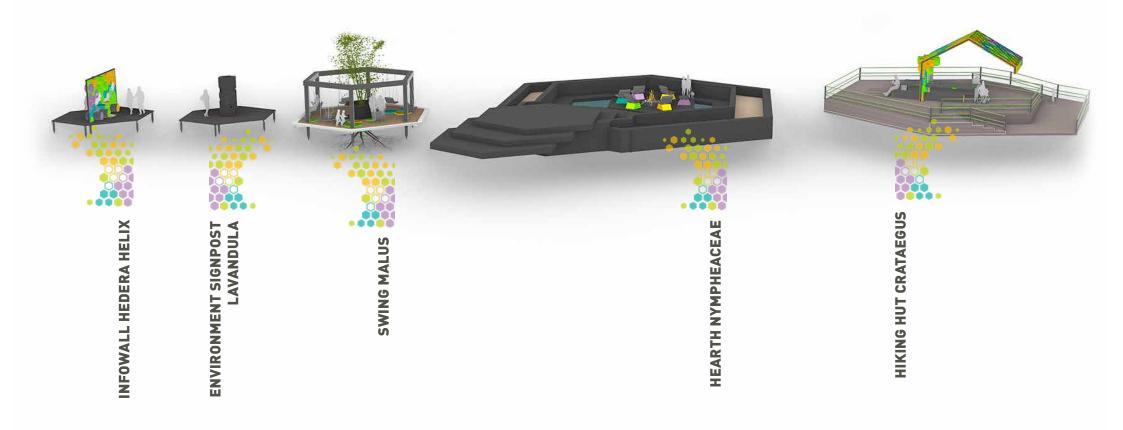


»The progressive province reconciles the regional with the cosmopolitan and tradition with hypermodernity.«

– Matthias Horx



### PLANTED TERRAIN FURNITURE WEIMARER LAND



# SWING MALUS







## Material quality, that meets the Cradle to Cradle Certified<sup>™</sup> product standard.

Cradle to Cradle<sup>®</sup> is one of the leading design principles for a circular economy modelled on nature. The focus is on preserving materials and resources in almost endless material cycles for the benefit of people and nature. Eco-effectiveness instead of eco-efficiency is the motto, i.e. generating maximum economic, ecological and social benefits through intelligent product design instead of just doing less badly. GCC (German Compact Composite) is certified according to the highest possible international product standard Cradle to Cradle Certified<sup>™</sup> with gold status and even achieves platinum status in the area of material health. This certifies comprehensive human and ecotoxicological safety. In addition to its function as a CO2 storage vessel, the 100% avoidance of cleaning agents and wood preservatives containing harmful substances, which would otherwise be used again and again in the maintenance of conventional site furniture, is also rated positively. This ensures that there is no problem shifting into the future.









The material GCC (German Compact Composite), of which the Weimarer Land terrain furniture consists, is a technical composite material made of 100% recycled raw materials based on wood residues as a byproduct from the industrial timber industry and polymers from first industrial application.

The material stream is designed in such a way that the GCC (German Compact Composite) material can be recycled and reused up to 5 times without downcycling. Together with the recycled raw material wood, the polymer component necessary for the composite properties also remains in the material cycle and thus does not pose a climate-relevant risk.

75% WOOD CONTENT IN GCC

PEFC certified forestry.

From accrued chips from wood processing, in a

25% POLYMER CONTENT IN GCC FROM FIRST INDUSTRIAL APPLICATION

Plastic polymer - and additives

GCC RECYCLATE

(Appearance after reprocessing of the composite material)

Material Components of the GCC Wood Type (German Compact Composite)

#### **CO2-Neutral Production**

Both during production and during subsequent reprocessing at the end of the lifecycle, 100% electricity from renewable energy sources is used. This means that all technical production and reprocessing processes are completely C02-neutral.

### No Additional Consumption of Raw Material

By using 100% recycled materials, the availability of raw materials is ensured without taking additional raw materials from nature. In addition to residues from the wood industry and GCC recyclate, polymers from the first industrial application are used.

#### THE MATERIAL CYCLE FOR THE MATERIAL GCC AS C02-STORAGE

With simultaneous CO2-neutral production and logistics, the proportion of wood used in the GCC (German Compact Composite) material - for 100 benches this is about 30 tonnes - can be considered a permanent CO2 store. The prerequisite is that the material used circulates in this cycle for more than 100 years. Only then does the storage effect take effect: The carbon from atmospheric CO2 bound in the wood fraction was then again extracted from the atmosphere and bound by the natural photosynthesis of regrown trees.

#### **CO2-Neutral Logistics**

In distribution, the focus is initially on net-zero neutral logistics, i.e. any emissions that occur are offset. As soon as the appropriate technologies can be used, all logistics processes will be converted to actual CO2-neutral.

#### 30 Years of Use

The robust material prevents vandalism and theft while extending the lifecycle three times more than the materials otherwise used for terrain furniture.

The high level of material health ensures that no harmful substances are released from the tourist site furniture for the benefit of people and nature.

#### Remanufacturing and Recycling

In addition to the single-component construction method, the recyclability of the selected material is a prerequisite for the recyclability of the outdoor furniture. The composite material GCC meets all the requirements for this. At the end of the product lifecycle of the outdoor furniture, the material can be reused for new products without any loss of quality or downcycling, thus ensuring CO2 capture for at least 100 years.

#### Secured Return

A contractual regulation guarantees the return of the material to the material manufacturer after 30 years of use..



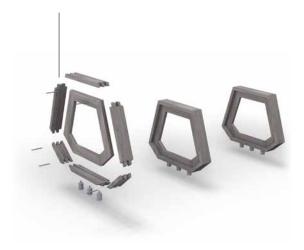
# **Circular Economy;** isn't just a concept anymore.

The innovation of the terrain furniture for the Weimarer Land lies in the planning design approach, building on a material stream that can serve as a CO2 storage vessel. The product design thus nourishes a permanent technical material cycle. Due to its material robustness, the bench has a life span of 30 years, at the end of which it is fed in one piece into a recycling process that has already been developed.

The return flow and thus the closing of the cycle is guaranteed via a binding take-back contract with the material manufacturer. The single-component construction of the outdoor furniture is part of this recyclable design approach and guarantees the 100% recyclability of the selected material GCC (German Compact Composite) after the end of the product lifecycle. The material composition enables transfer to further product lifecycles without any loss of quality.



The single-component design with material-pure (metal-free) connection points as a plug-in system guarantees complete detachability and recyclability without residues and sorted by type.

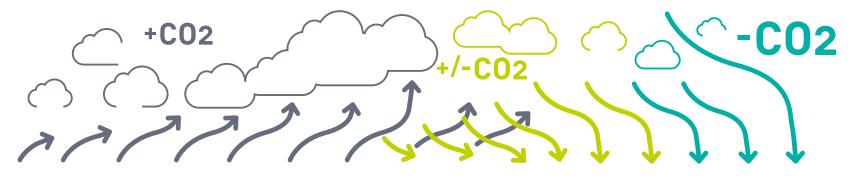




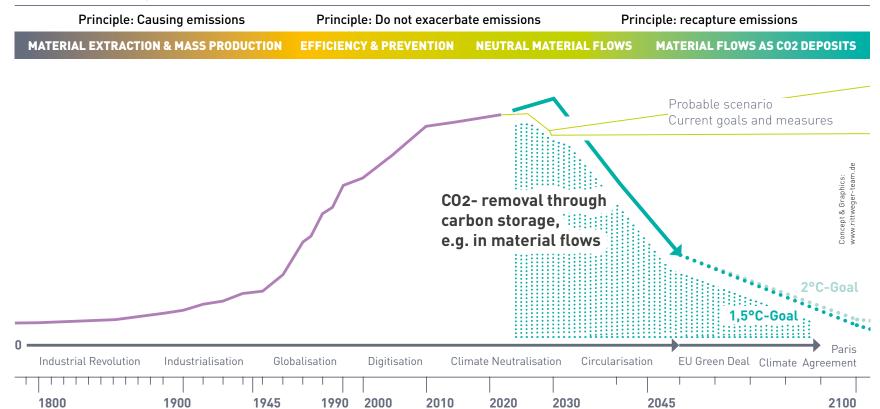
## **Climate protection,** which has a direct effect for at least 100 years.

Removing CO2 from the atmosphere and storing carbon in material flows is currently the most sensible and effective way to counter climate change. Because CO2 emission avoidance, reduction and compensation will not be sufficient to limit global warming to 1.5 degrees in accordance with the Paris Climate Agreement. By extracting the carbon from CO2 and storing it in the material used for our terrain furniture for at least 100 years, we are helping to reduce the amount of CO2 in the Earth's atmosphere.

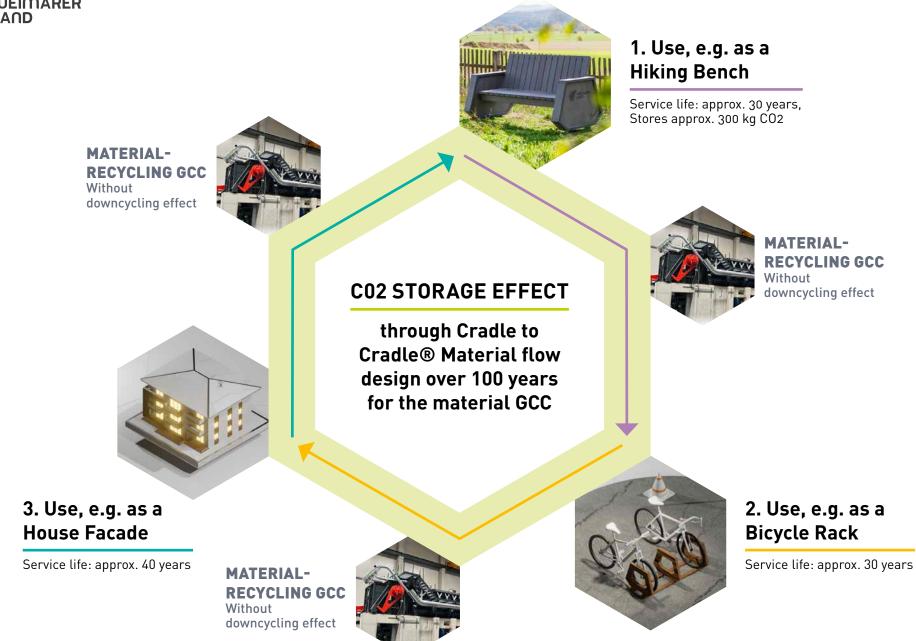
With the prototypes of our outdoor bench Silva and the bicycle racks Salaix, we show in an exemplary way how technical material flows can be developed as permanent CO2 reservoirs and how all future terrain furniture must be designed in such a way in order to exert a direct and sustainable influence on global climate protection in addition to aesthetic and functional aspects: produced CO2-neutrally via renewable energies and circulating in material cycles.



CO2-Greenhouse gas emissions into the atmosphere | Prevention, compensation and substitution | CO2-Capture from the atmosphere







### Bank Silva stores 300 kg of CO2 from the atmosphere.

The model project thus shows how medium-term CO2 storage in products and material cycles already works today without social or environmental risks through circular material flow design.

UEIMARER





## **Sustainability,** which pays off for every municipality.

The product design is such that it enables sustainable procurement for the municipalities in the Weimarer Land region. The chosen material is maintenance- and disposal-free. The material properties extend the useful life of the bench from approximately 10 to 30 years. This not only sustainably reduces the consumption of resources, but also significantly lowers the overall costs. During the prototype phase, a lifecycle assessment was carried out for the total lifecycle costs comparatively to wooden benches, which usually have to be repainted every four years. It provides proof that sustainable product design also pays off economically - with net zero CO2 emissions at the same time. C02-Emissions over 30 years net: **Oq** 

CO2-Storage capacity per bench in the wood content:

### **0,3**t

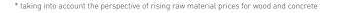
Total cost savings over 30 years: 11.100 €



#### Traditional Bench (wood/concreate) Ø 10 YEARS OF DURABILITY, **RESOURCE & EMISSIONS INTENSIVE**

Total costs for 3 x 10 years:	18.900 €
Total lifecycle costs over 10 years:	6.300€
<ul> <li>Dismantling / disposal</li> </ul>	600€
<ul> <li>Vandalism repair*</li> </ul>	1.000€
> Maintenance*	1.200€
<ul> <li>Installation costs</li> </ul>	2.000€
<ul> <li>Productions costs*</li> </ul>	1.500 €







#### **Sustainable Bench Silva** Ø 30 YEARS OF DURABILITY, RECYCLABLE AND STORES CARBON IN THE LONG TERM

<ul> <li>Productions costs:</li> </ul>	3.500 €
<ul> <li>Installation costs:</li> </ul>	1.500 €
<ul> <li>Cleaning maintenance:</li> </ul>	1.800 €
<ul> <li>Vandalism repair:</li> </ul>	1.000 €
<ul> <li>Dismantling / disposal:</li> </ul>	Return at no cost

Total lifecycle costs over 30 years: 7.800€

#### **ORIGIN. SPIRIT. ARISING.**

# **POINTS OF CONTACT**

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All information on CO2 sequestration is conceptual modelling and not verified, with no guarantee of a calculation in line with standards, as corresponding standards are currently only being developed. As the project progresses, further calculations may take place with corresponding adjustments to the figures and data.

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NETZWERK FÜR NACHHALTIGES WIRTSCHAFTEN