

**Thursday  
June 8**

## **Keynote Construction Industry**

*The role of lightweight for promoting sustainable construction and infrastructure. The transformation of the construction industry – examples on lightweighting, renewable materials and business models promoting circularity.*

**Gunnar Merz**

CEO of Composites United  
Germany



# The role of lightweight for promoting sustainable construction and infrastructure

3<sup>rd</sup> Conference of the European Lightweighting Network, Stockholm

**Gunnar Merz**

CEO of Composites United Germany

# Key note

The transformation of the construction industry – **examples** on lightweighting, renewable materials and business models promoting circularity

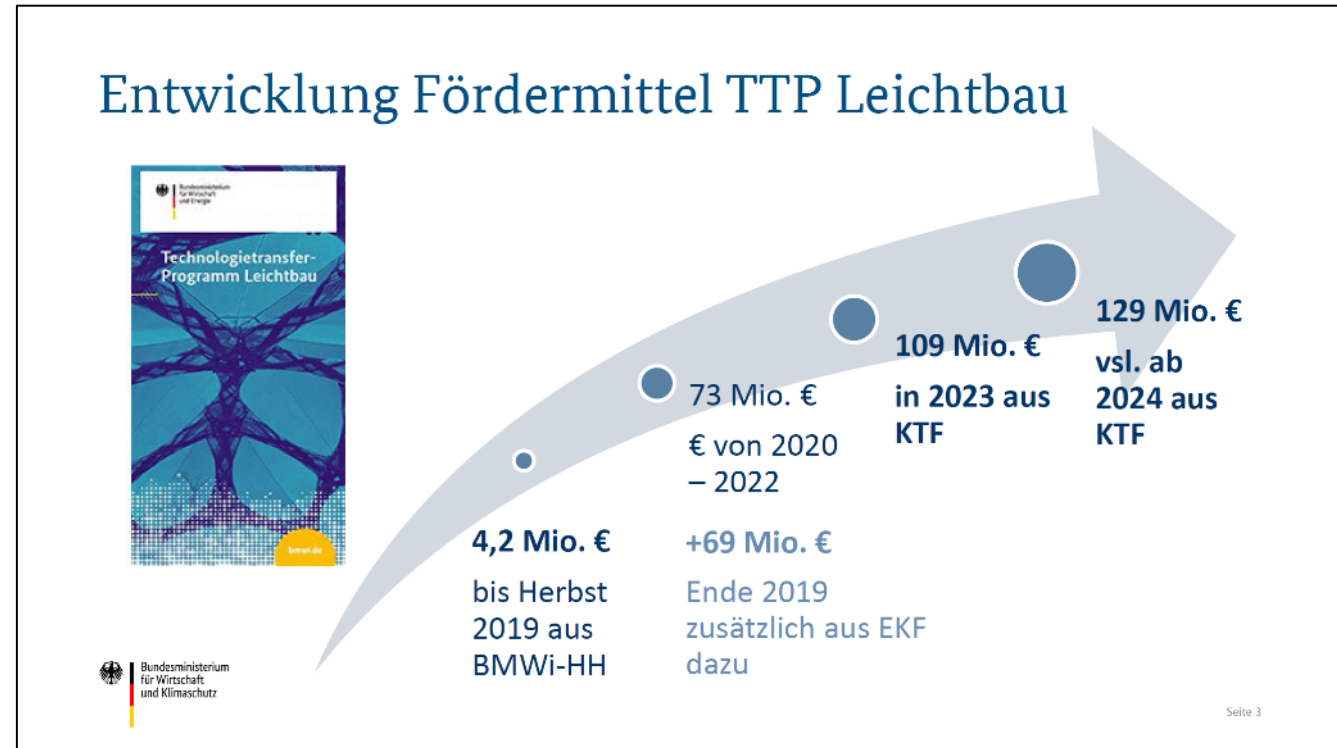
1. Framework Conditions in Germany: Lightweight Construction Initiative of BMWK
2. Trends: additive manufacturing and serial prefabrication
3. Renewable Materials: Fungi (and biopolymers) and wood polymere composites made from woody byproducts and recycled windmills
4. Business Models: lease instead of sale (and get your raw material back)
5. Barriers and approaches

# 1. Framework Conditions in Germany: Lightweight Construction Initiative

- Lightweight is cross-sectional
- The German Lightweight Construction Initiative brings together relevant actors and sectors
- Promote open-material research and development
- Achieve economies of scale
- Achieve awareness



Lightweight Construction Atlas



Funding Technology Transfer Programme

## 2. Trends: additive manufacturing and serial prefabrication

- Wood-concrete composite ceilings
- Faster construction time (optimised setting behaviour, easy laying of reinforcement)
- CO<sub>2</sub> savings through the use of wood (substitution of 2/3 of the reinforced concrete cross-section)
- Goal: Prefabricated facade and wall elements





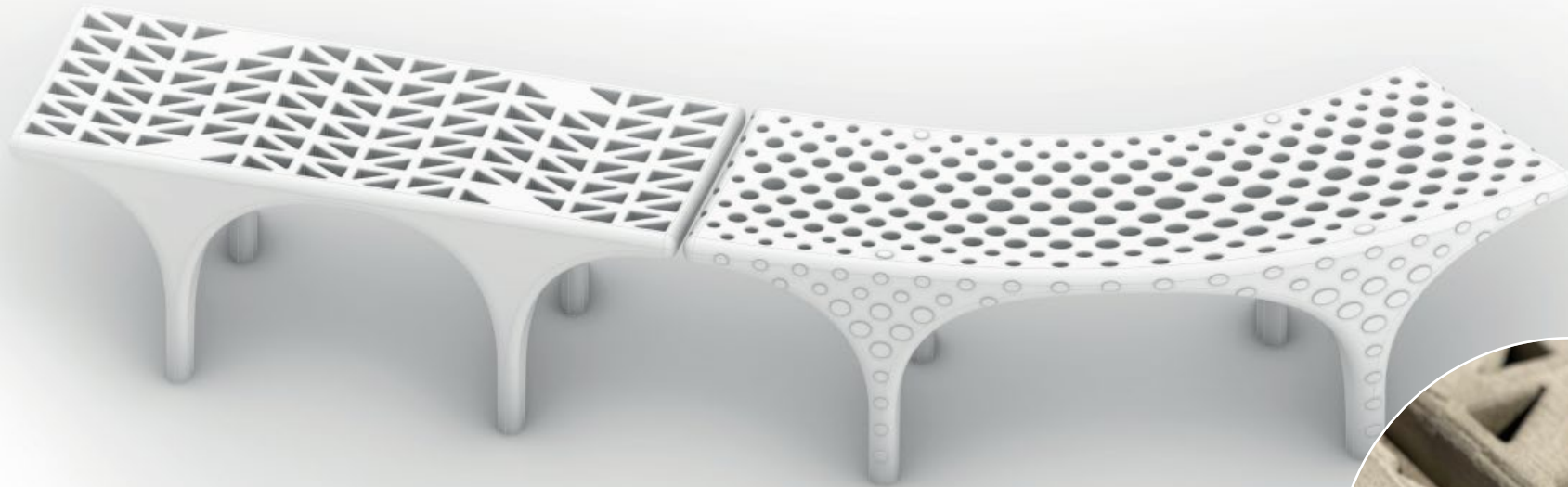
## 2. Trends: additive manufacturing and serial prefabrication

- Pedestrian bridge made of prestressed carbon concrete (CPC)
- CPC bridge deck with fixed carbon beams
- The U-shaped carbon beams are produced in a vacuum assisted resin infusion process
- Weight saving 3/4 compared to conventional reinforced concrete with the same capacity



Source: Federation of Reinforced Plastics (ZHAW, CPC AG, Silidur AG, aXpel Wernli composites AG)

# Printed Benches





# 3. Renewable Materials: Fungi (and biopolymers)

- Interdisciplinary research teams
- Combination of additive manufacturing (structures made of biopolymers) with mushroom composite materials of local origin
- Raw materials are obtained by recycling agricultural waste products
- Product is separable and recyclable / compostable



Bild: SenWEB



Studio Sven Pfeifer, Berlin

### 3. Renewable Materials: wood polymere composites made from woody byproducts and recycled windmills

- 6.5-meter free-spanning spatial supporting structure (with a static height of only 27 cm)
- made of wood polymere composites
- Innovation: Product made of wood fibres (by-products of the sawmill industry) and synthetic resin, processed from recycled windmill rotor blades

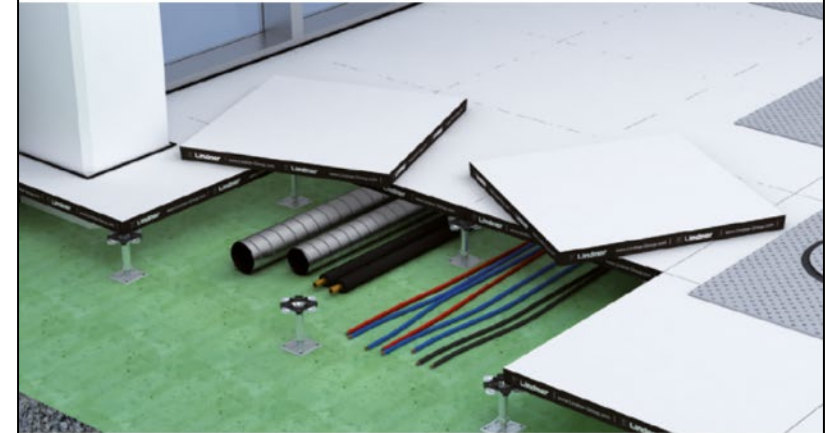


## 4. Business Models: Lease instead of sale

- RessProKA focuses on the optimisation of the technical cycle and the development and implementation of commercial and legal elements in business models for products which may remain the property of the manufacturers throughout their entire service life.
- After use, the manufacturers are also responsible for recycling and remanufacturing.
- RessProKA pursues a systemic approach, which is intended to enable the transfer of the developed models to other construction products in terms of concept and instruments.

### RessProKA

Closing resource-efficient product cycles in the finishing trade through new business models



Resource-efficient Circular Economy – Innovative Product Cycles (ReziProK)

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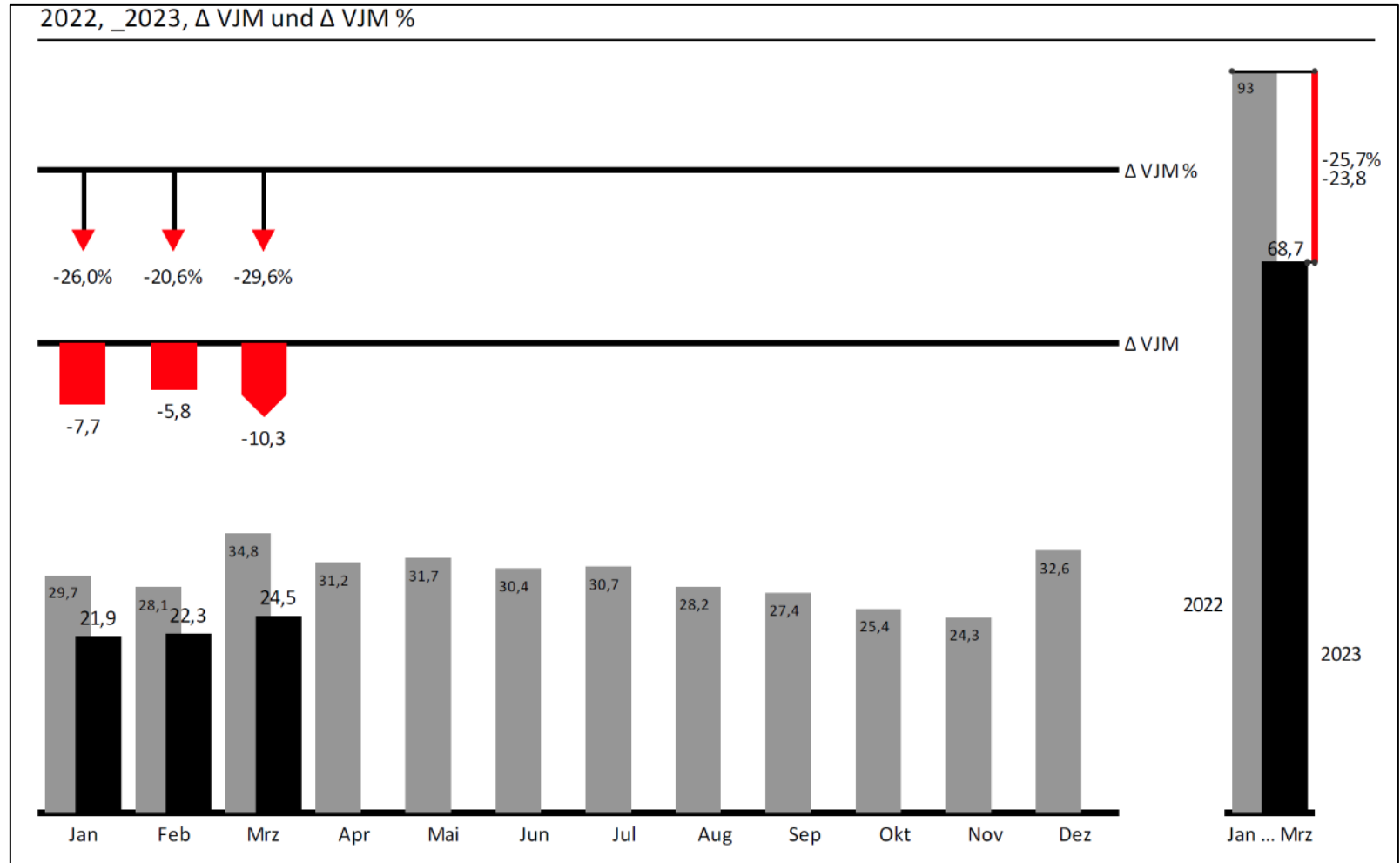
**FONA**

Research for sustainability

[reziprok.produktkreislauf.de/en](https://reziprok.produktkreislauf.de/en)

# Barriers and approaches

- High construction costs and high construction interest rates lead to a dramatic decline in building permits / construction
- Lightweight construction has an even harder time than usual in this constellation - as often only the pure investment costs are considered, but not the longevity and lower maintenance costs
- Classic barriers: lack of standardization
- Fear of novelty as an obstacle to larger investments



Germany: Number of approved dwellings in residential and non-residential buildings in thousands, Source: VHI / Statistisches Bundesamt

# Gain more attention: Lightweight Innovation Award (Berlin)

WIR LIEBEN  
DAS WARUM.

LIVE HÖREN 



Bild: Senatsverwaltung für Wirtschaft, Energie und Betriebe [DOWNLOAD \(MP3, 3 MB\)](#)

Wirtschaft

## Preise für Leichtbau-Lösungen verliehen

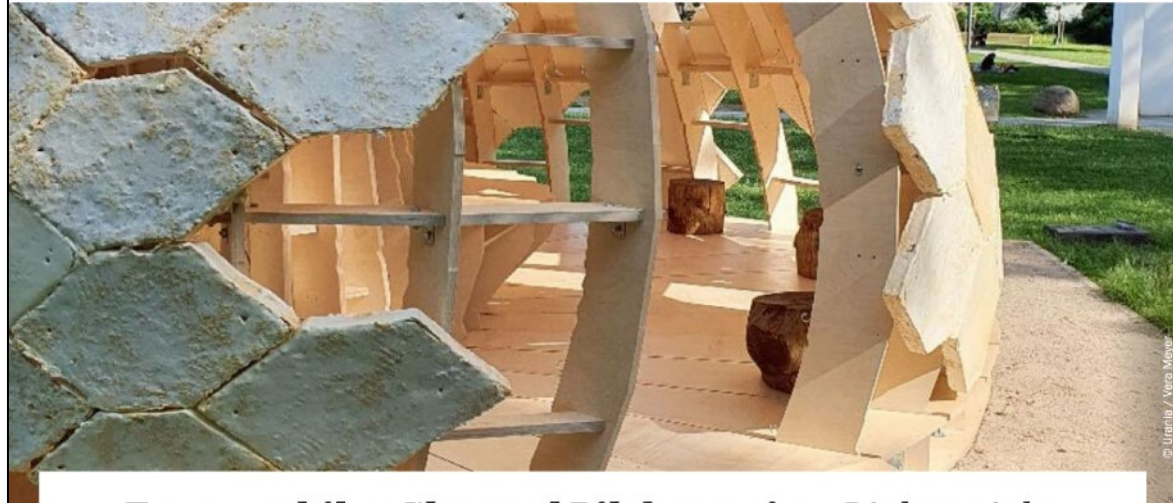
Beim am Mittwoch zum ersten mal vergebenen "Lightweight Innovation Award" geht es um neue Lösungen in Leichtbauweise. Und anders als man annehmen könnte geht es da

## TAGESSPIEGEL

 Politik Internationales Berlin Gesells

Bezirke Berliner Wirtschaft Polizei & Justiz Stadtleb

[Berlin](#) | [Berliner Wirtschaft](#) | Extra stabiles Glas und Pilzbauweise: „Lightweight Awards“ in Berlin verliehen



## Extra stabiles Glas und Pilzbauweise „Lightweight Awards“ in Berlin verliehen

Die Wirtschaftsverwaltung hat einen neuen Preis für innovative Lösungen ins Leben gerufen. Am Mittwoch wurden die Preisträger bekannt gegeben.



Bild: SenWEB

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**Thank you**

**Gunnar Merz**

CEO of Composites United  
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