



**INTERNATIONAL
BALKAN
UNIVERSITY**
EXCELLENCE FOR THE FUTURE



XVIII International WoodEMA 2025 Scientific Conference

WOOD FOR THE FUTURE: INTEGRATING SUSTAINABILITY ACROSS INDUSTRIES

Ohrid, North Macedonia

September 17th-19th 2025

The Role of Wood in Sustainable Architectural Design
Jasna Grujoska-Kuneska
International Balkan University, Skopje, N. Macedonia



The Concept of Sustainability

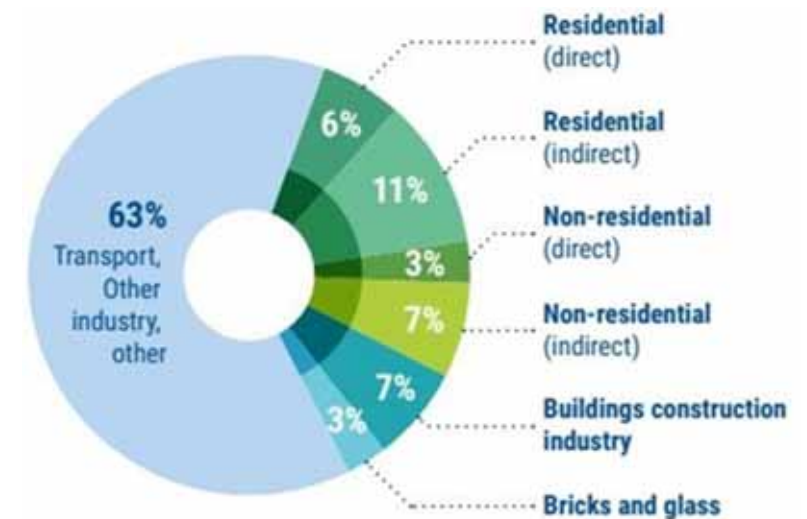
Sustainability definition - The World Commission on Environment and Development:

“Development that meets the needs of the present without compromising the ability of future generations to meet their own needs”.

Principles of sustainable architecture:

- Minimizing environmental impact
- Minimizing negative effect on human health
- Promoting healthier living environments
- Efficient use of materials and resources

Emissions by sector - share of buildings in global energy emission in 2022





Sustainable Aspects of Wood

Wood is one of the oldest sustainable materials

- Renewable
- Reusable and recyclable
- Biodegradable
- Durable
- Small environmental impact
- Supports healthier living environments
- Improves energy efficiency
- Reduces energy consumption





The Role of Wood as a Structural Component

Wooden pagoda, XI c.



Timber-frame house, XV c.



Traditional houses, XIX c.



Glue-laminated structure, XXI c.



Medieval church, XIII c.



Log cabin, XVII c.



Modern multi-storey building, XXI c.



The Role of Wood as a Structural Component

Sustainable aspects:

Technology

Treatments – improve durability

CLT, GLT – enables broader application

Economic

Time – efficiency

Cost - efficiency

Use of prefabricated wooden components

Environmental

Less energy to extract and process

Reduce CO₂ footprint



The Role of Wood as Building Envelope

Facades are vital element of the buildings, which impact:

energy efficiency

quality of indoor space

first impression for the building

Dynamic wood facades – Kinetic cladding

- Movable components responsive to environmental conditions
- Reduces energy demands
- Enhance comfort





The Role of Wood in Interior Design

Sustainable wood use - emphasizes use of renewable and responsibly sourced materials:

- Reclaimed wood
- Bamboo
- Certified woods from managed forest

Reclaimed wood

Repurposing the wood from old buildings (houses, barns, industrial)

From structural to decorative use

Application: wall and ceiling panels, flooring, furniture, shelving, decoration...





The Role of Wood in Interior Design

Sustainable aspects:

Resource efficiency

Recyclable

Reusable

Reduces waste and need for new materials

Indoor quality

Antibacterial properties

Moisture buffering capacity

Hygroscopic nature

Psychological effect

Natural appearance

Pleasant and welcoming material

Enhance the mood



Summary

- Exceptional versatility: structural component, surface envelope or decorative feature.
- Across its different applications it brings unique contribution to sustainability.
- Structure – stores carbon, lower the environmental footprint of construction.
- Facade & Envelope – improves energy efficiency, support renewable sourcing.
- Interiors - enhances indoor comfort, contributes to healthier environments.



XVIII International WoodEMA 2025 Scientific Conference

WOOD FOR THE FUTURE: INTEGRATING SUSTAINABILITY ACROSS INDUSTRIES



**INTERNATIONAL
BALKAN
UNIVERSITY**
EXCELLENCE FOR THE FUTURE!



КИ-ПАР
www.kipar.com.mk

Thank you for the attention!