



# Introduction to Advanced Ecological Buildings & Biocities

**Instructor: Michael Salka**

**Department: Architecture**

## Question 1

Why should emerging designers, architects, and engineers be equally concerned with the materials their buildings are made from as how those buildings look or how they work?

- Remember: which 3 materials commonly used in contemporary buildings are responsible for 23% of global CO<sub>2</sub> emissions?
- Understand: what is the difference between operational and embodied emissions, and why should designers, architects, and engineers start paying more attention to embodied emissions?
- Apply: what kind of materials might a building with low embodied emissions be made of?
- Analyse: how might the new construction required over the coming decades to accommodate ongoing trends in worldwide population growth and urban to rural migration impact global climate change?
- Evaluate: is it possible for new construction to help mitigate and adapt to global climate change, rather than make the problem worse?
- Create: using words, sketches, or collaged images, propose a near future building or city that helps mitigate and adapt to global climate change due to the choice of materials used.

## Question 2

Why is the use of wood, or more specifically engineered timber products, such a promising pathway for future buildings - even large buildings in cities?

- Remember: what are the four ways we can think about the carbon sequestration potential of wood-based building products?
- Understand: why do other materials commonly used in contemporary buildings emit carbon, and why do wood-based building products have the potential to sequester carbon?
- Apply: what materials other than wood might be used to sequester carbon in buildings?
- Analyse: how might the use of wood-based materials change the design of buildings in terms of their structure, appearance, and performance?



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## Question 2, continued

- Evaluate: what is different about how people use buildings now than in the past, and how might those differences be supported by the possible changes in the design of buildings in terms of their structure, appearance, and performance resulting from the use of wood-based building products?
- Create: using words, sketches, or collaged images, propose a near future building or city that uses wood-based building products to meet the new needs of the people who inhabit them in new ways.

## Question 3

What are the main risks or challenges associated with increasing the amount of wood-based materials used in buildings, and how can they be avoided or mitigated?

- Remember: what are the main risks or questions associated with wood-based building products that researchers, designers, architects, and engineers are still studying?
- Understand: why might these risks or the answers to these questions be different for wood than for other building materials?
- Apply: which other bio-based building materials have the same risks or questions to answer or solve as wood, and which might avoid those risks or present answers or solutions to those questions?
- Analyse: how might the design of buildings in terms of their structure, appearance, and performance change in order to solve the questions or problems associated with wood-based building products?
- Evaluate: is finding answers or solutions to the risks or questions associated with wood-based building products worth the effort? Why do you think so?
- Create: using words, sketches, or collaged images, propose a vision for how the material for wood or other bio-based building products can be obtained without destroying forest ecosystems.