



Building eco-design at competition stage: a case study

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- Eco-design process
- Conclusions and perspectives



Context, goal and scope



Context

- Tekhnê Architectes made a proposal during an architectural design competition for the construction of a secondary school.
- Tekhnê included a Life Cycle Assessment (LCA) in their proposal.
- Cycleco took over this LCA and decided to deepen the interpretation phase in order to use it as of a case study for training purposes.



Goal

- Tekhnê's objectives:
 - Meet building owner's requirement: assess embodied energy
 - Stand out from the competitors by going one step further and providing a comparison of 2 scenarios on primary energy and climate change impacts
- Cycleco's objectives:
 - Validate Tekhne's conclusions by extending the analysis to a more complete set of indicators
 - Adjust design according to impacts results



Scope

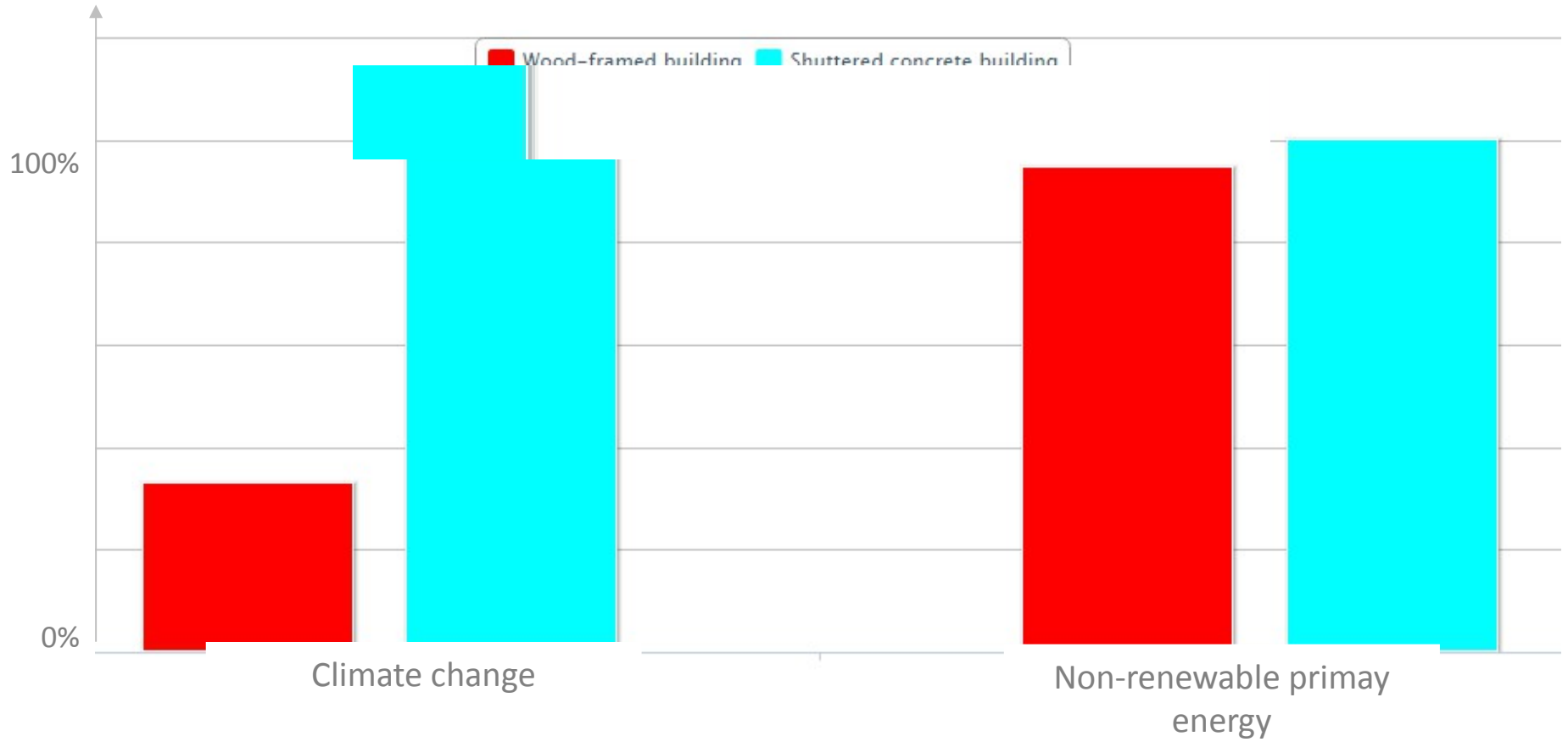
- Functional unit: “Provide an enclosed and insulated space of 1544m² floor area, with an energy consumption <120kWh/m²/year, for use as a secondary school during 60 years.”
- Scenarios:
 - a wood-framed building (favourite scenario)
 - a shuttered concrete building
- System boundaries:
 - Structure, interior & finishing work packages
 - Included processes: manufacture, transport, installation, deconstruction and landfill of building products (construction and replacements)



Eco-design process

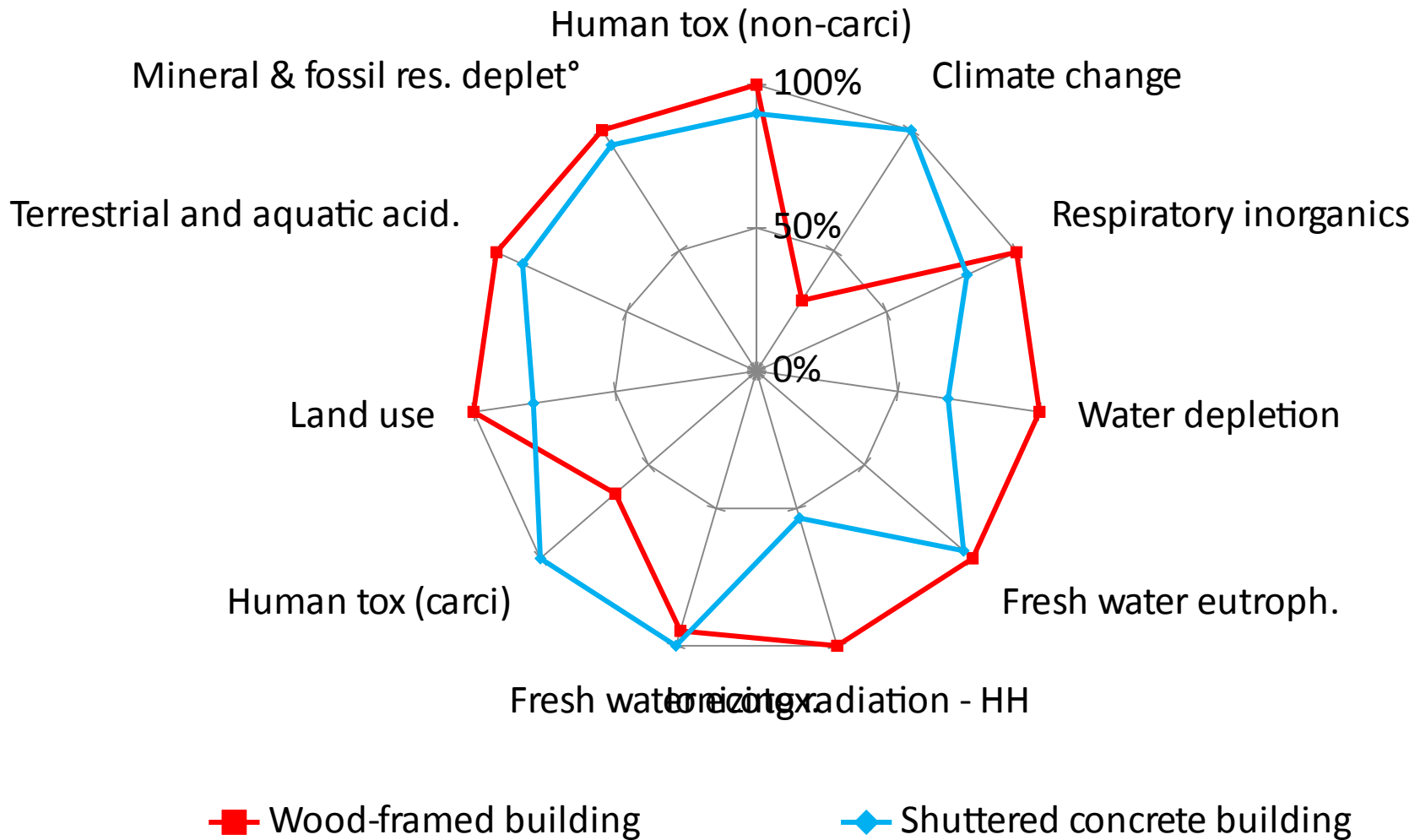


Firsts results



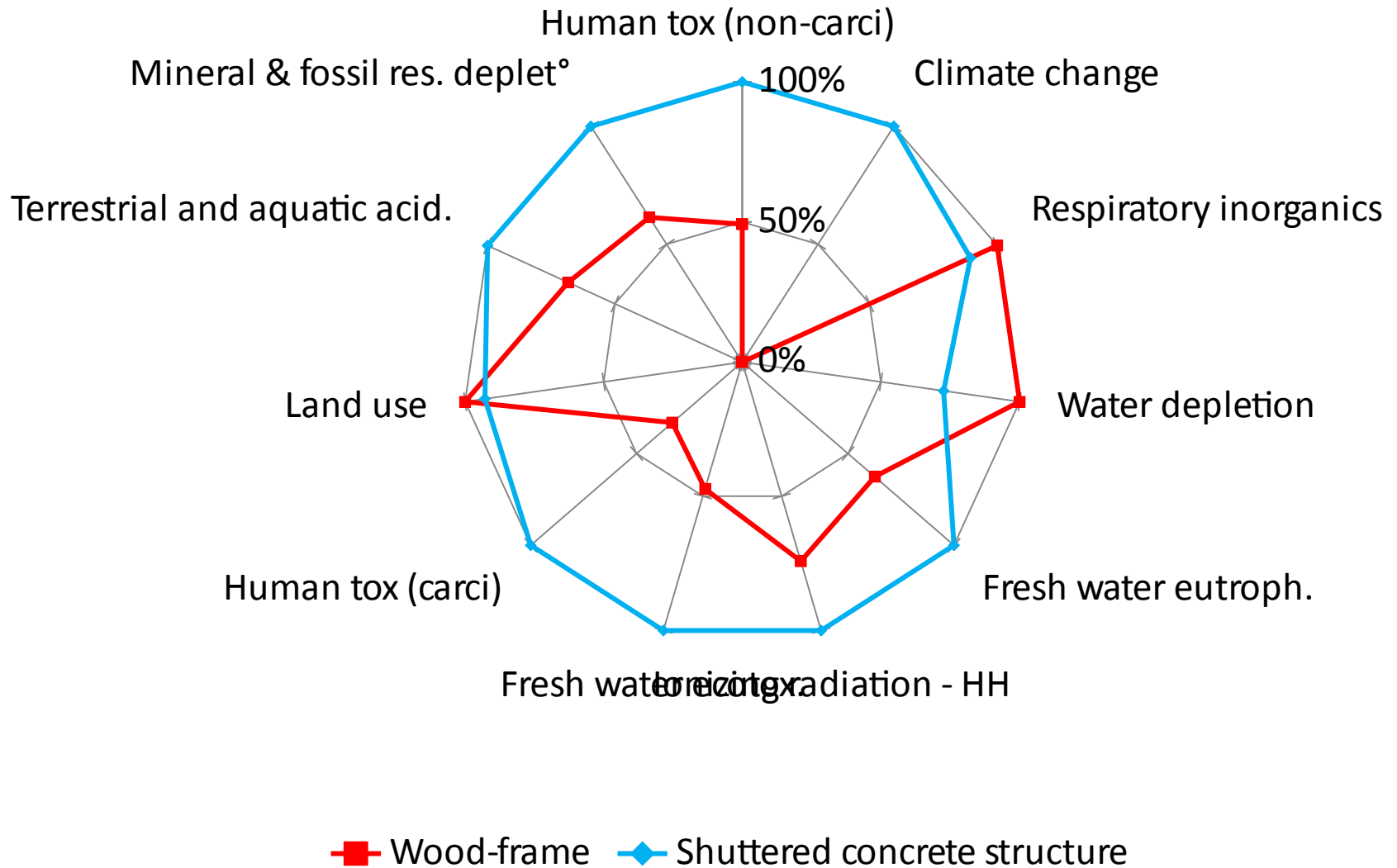


Extended set of indicators

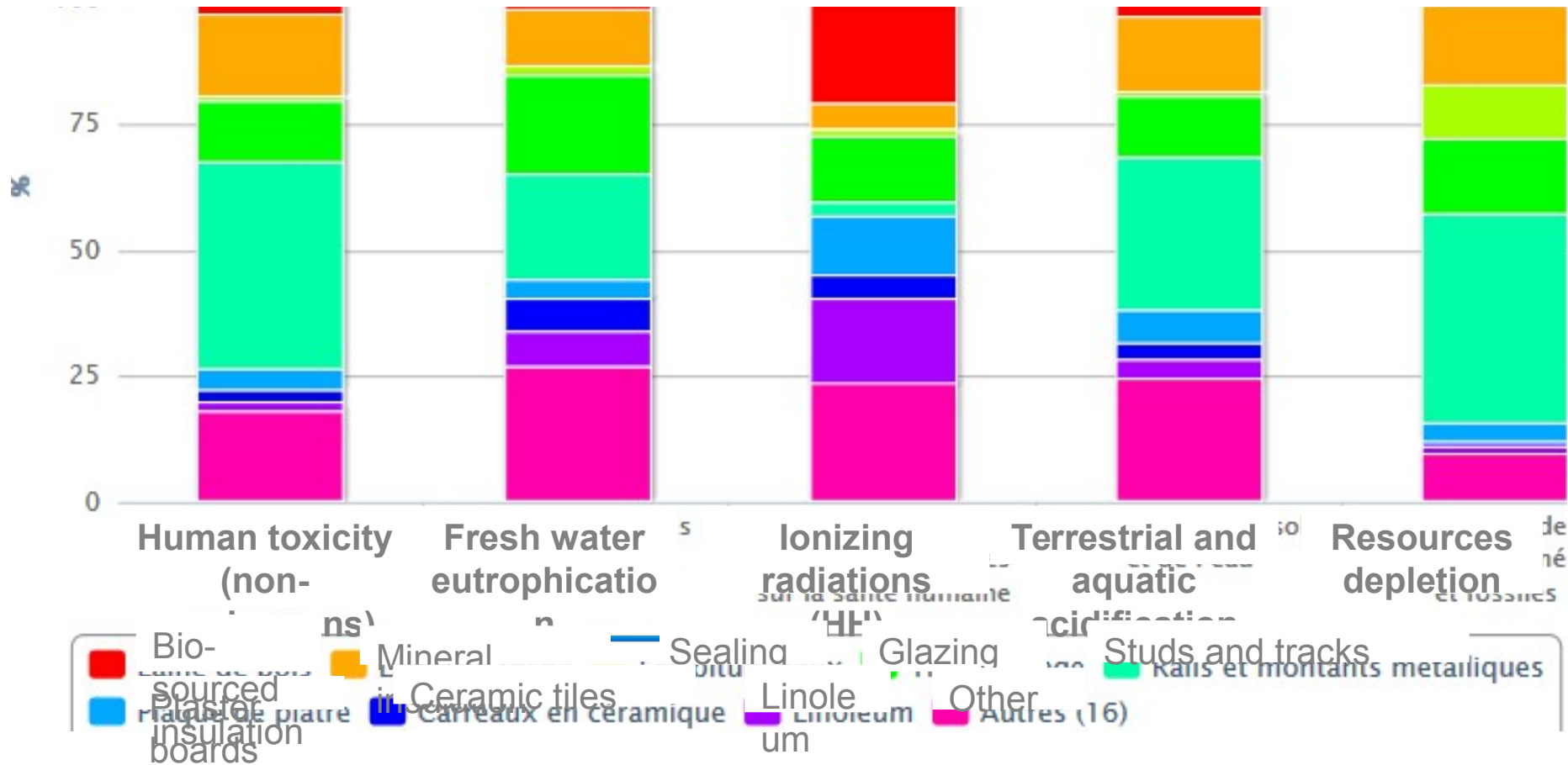




Comparison of structures

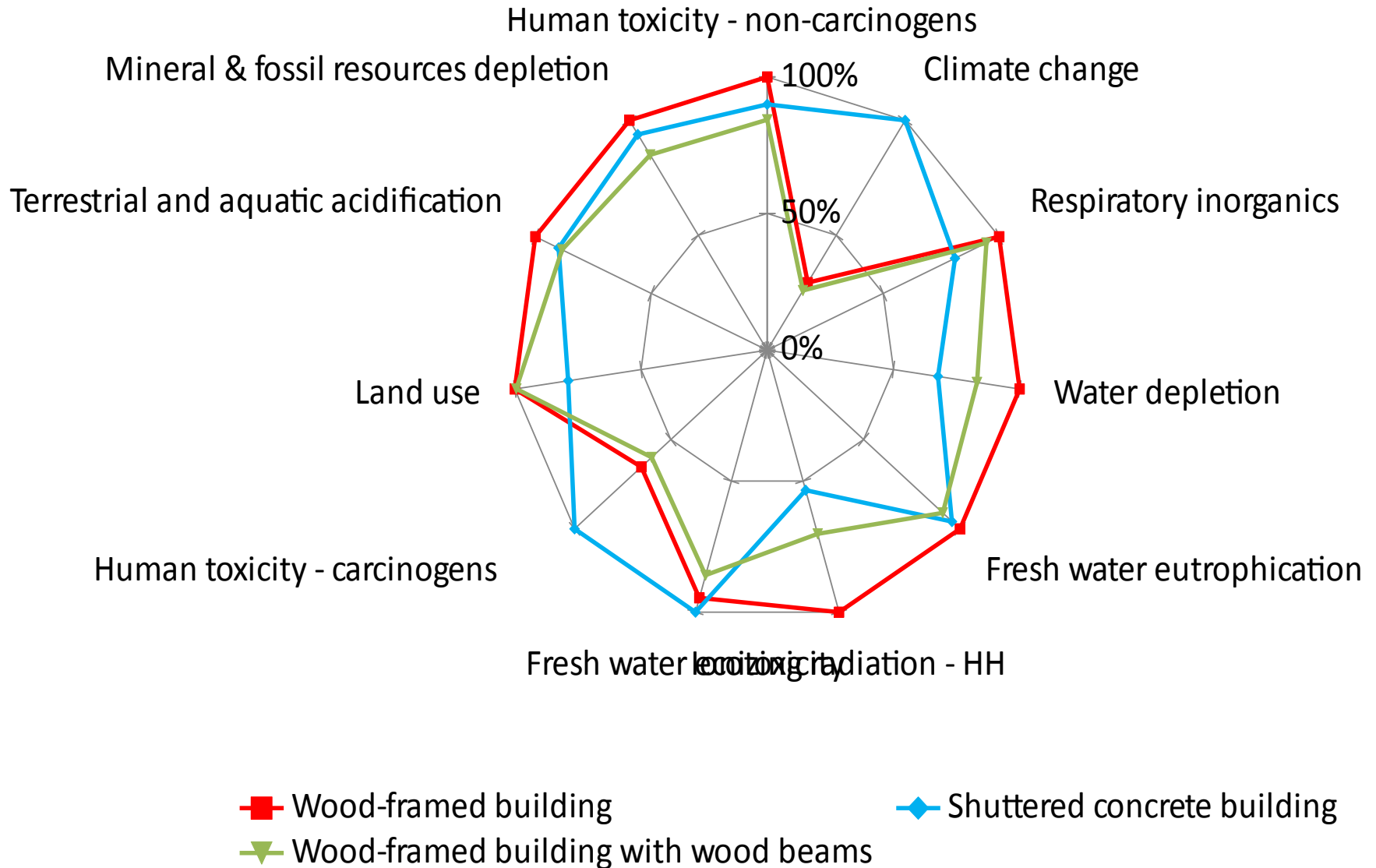


Wood-framed building hot spots analysis





Comparison with a third alternative





Conclusions and perspectives



Study outcomes

- It is of main importance to study the whole system
- Hot spots analysis is a valuable tool for eco-design
- It is of main importance to enlarge the scope of indicators
- Hot spots analysis should be conducted on indicators for which the “a priori” favourite scenario is not the best
- Eco-design is accessible to building professionals at competition stage



Tool for intuitive building eco-design

Thank you

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