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Amélioration de la prise en compte du carbone biogénique dans les ACV des bâtiments

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Problématique

In order to minimise a building's environmental impacts, it is essential to properly assess the impacts of different design choices. Within life cycle assessment (LCA) studies, the use of wood products has long been assumed to have a net zero carbon balance, but there is an increasing body of scientific evidence that the actual climate impacts are dependent on many factors. The assumed carbon neutrality stems from the fact that biomass is expected to release the same amount of carbon dioxide upon final disposal as is sequestered during its growth. The neutrality assumption ignores, in particular, issues such as temporary carbon storage and carbon balance of managed vs natural forests, which can lead to drastically different outcomes in terms of environmental impacts.

L'objectif de la recherche

The main objective of this project is to develop a method that reliably accounts for the uptake, emission and storage of biogenic carbon in wood product LCAs.

Méthodologie

1. Compare the various published approaches
2. Identify key parameters that could have a non-negligible impact on forestry carbon cycles.
3. Develop a forestry carbon cycles model, applicable to wood building construction.
4. Develop a database for construction wood in Canada using the forestry carbon cycle model.
5. Identify key post-wood harvest parameters affecting carbon storage issues
6. Identify potential for burden shifting as a consequence of alternative uses of forestry products.
7. Develop a model that considers key parameters of the post-harvest phases of wood products.
8. Develop a database of wood products from the point of harvest to end-of-life.
9. Carry out a case study in order to test the models

Applications potentielles et retombées industrielles

- Account for biogenic carbon in wood product life cycle assessments. Currently practitioners are already capable to account for biogenic carbon (net zero assumption); this research project aims to enhance the relevance of the assessment
- Consider the time that carbon is stored in a wood product and account for it accordingly.
- Include the climate impacts of carbon storage in landfills in the LCAs of wood products.
- Account for differences in the wood resources, depending on the type of forestry management practiced.