The role of wood products in tackling climate change

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Wood in construction : main environmental assets :

- A **renewable and effectively renewed materials source** : the European forest is sustainably managed and the resource is increasing
- The **forestry-wood chain is strongly oriented towards the circular economy concept** : both transformation co-products and end-of-life waste wood products are used as raw materials or energy resources to a very high extent
- The forestry-wood chain presents **four characteristics of high interest for climate change mitigation** :
  - The forest carbon sink
  - **The carbon storage effect**
  - **The substitution effect**
  - The building energy efficiency of timber construction

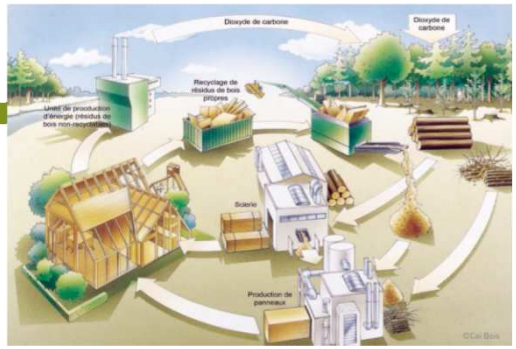
The carbon storage effect :

- Wood products contains carbon taken from atmospheric C02 during the tree growth (about 50% dry weight) : while C is stored in wood products, it is not in the atmosphere as CO2, hence does not contribute to greenhouse effect;

1 m3 wood ~ 1 t CO2

- Depending on type of product (carpentry or joinery), service life can range from a few decades to a century : such C storage durations are significant regarding climate change

- According to IPCC guidelines, harvested wood products stock increments can be accounted for as a carbon sink;
  (France 2013 : +2,52 Mteq.CO2)



The substitution effect :

- The **carbon footprint of products** : quantitative analysis of the emissions of greenhouse gases emissions over their life cycle, from the raw materials extraction until the waste treatment, including product manufacturing, transportations, construction work and use and maintenance

- The **carbon footprint of construction products made of wood** is, in a very large majority of cases, **significantly lower than the carbon footprint of the products made of competing materials** :

→ **lower energy consumption** for wood transformations than for other materials, **significant use of biomass energy** in the processes and a **good level of recycling and energy recovery** at the end of life

The substitution effect :

- The **GHG emissions saving** generated by the substitution of a competing material based product by a wood product is named « **Substitution effect** ».

- Recent study commissioned by the EC and published in 2016 (Climwood2030*), calculations at the European level :

  « the **material use of wood products** instead of functionally equivalent alternative products leads to a **decrease of fossil based GHG emissions** over the whole life cycle of about **1.5 à 3.5 t CO2 per ton of wood product**."

* Mean European values - S. Rüter, S, F. Werner, N. Forsell, C. Prins, E. Vial, and A.L. Levet. 2016. "ClimWood2030, Climate Benefits of Material Substitution by Forest Biomass and Harvested Wood Products: Perspective 2030." Braunschweig: Johann Heinrich von Thünen-Institut.

The substitution effect :

- **The end of life** of the construction product is also important **:**
  - ✓ **Recycled** in particle board **the carbon storage is prolonged**
  - ✓ Used for **energy recovery, it substitutes fossil fuels, which reduces fossil CO2 emissions** (about 0,5 t CO2 eq./m3 French value)

- France 2015 : the substitution effect of the energy and material use of wood is estimated to represent 34 Mt CO2eq /y emissions saving.

The climate benefits of using wood in construction :

- **Carbon Storage :** benefit accounted for in National emissions inventories, when the wood products amount on the market is increasing
- **Substitution effect :** most wood products have a lower carbon footprint than competing materials : using wood instead of other materials reduces the emissions of the construction sector
- **Increasing the use of wood for construction means producing more co-products for renewable energy,** with again a substitution effect by reducing the use of fossil fuels

The development of the use of wood in construction, procured from sustainably managed forests, is an effective tool for climate change mitigation