

CASE STUDY

Construction

CLADDING

Location

Hungary

System boundary

production of building products (A1-A3)
 transport to construction (A4)
 construction (A5)
 maintenance and replacement, if necessary (B4-B5)
 end of life (C1-C4)

Origin of data

Constructions: IS-SusCon project
 Background data: OneClickLCA database, selection of the most representative datapoints for Hungary,
 see methodological details in the document "**Hungarian building constructions**"

CLADDING



Functional unit

1 m² surface

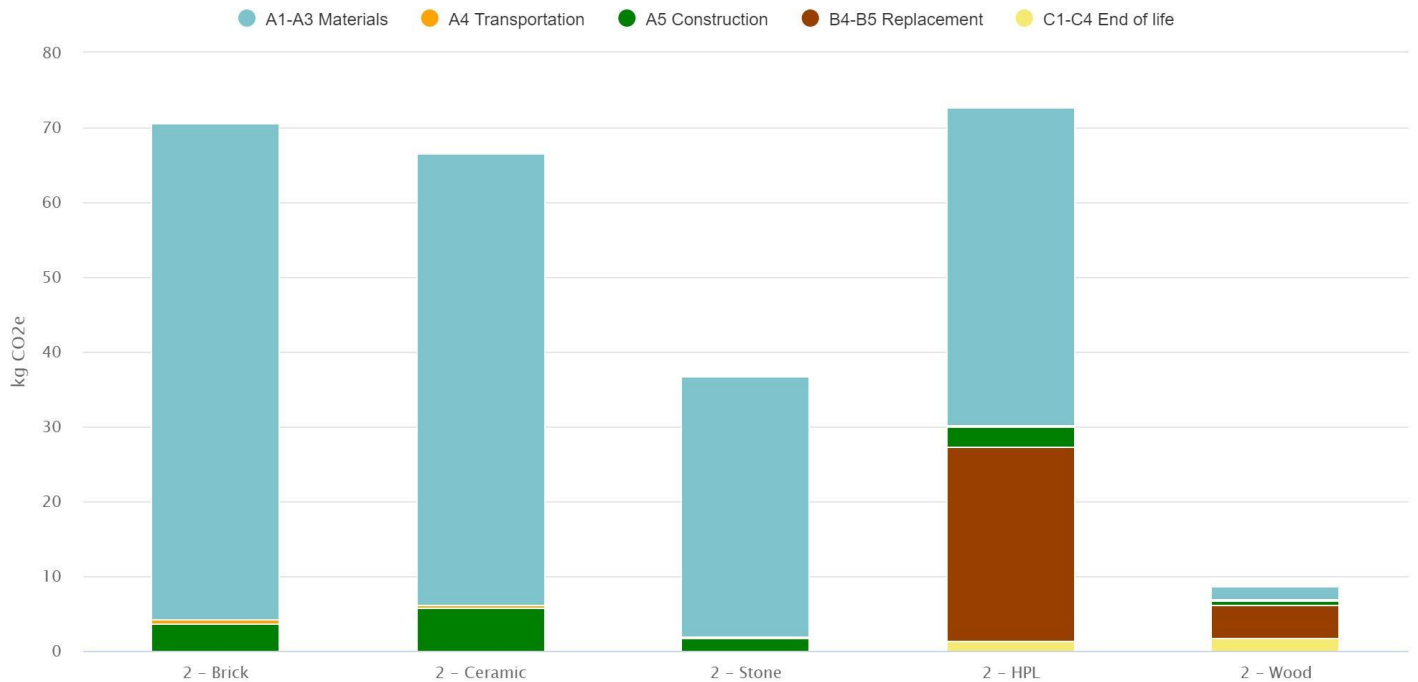
50 yr building life time

Solutions:

	Material	Other elements	Maintenance/Replacement
Brick	brick	steel fixing elements	
Ceramic	ceramic	aluminium fixing elements	
Stone	stone	steel fixing elements	
HPL	HPL board (High Pressure Laminate board)	aluminium fixing elements	replacement in every 25 yr
Wooden	wood	wooden battens	coating in every 10 yr

Impact assessment

Global Warming Potential (GWP)



Interpretation of GWP results:

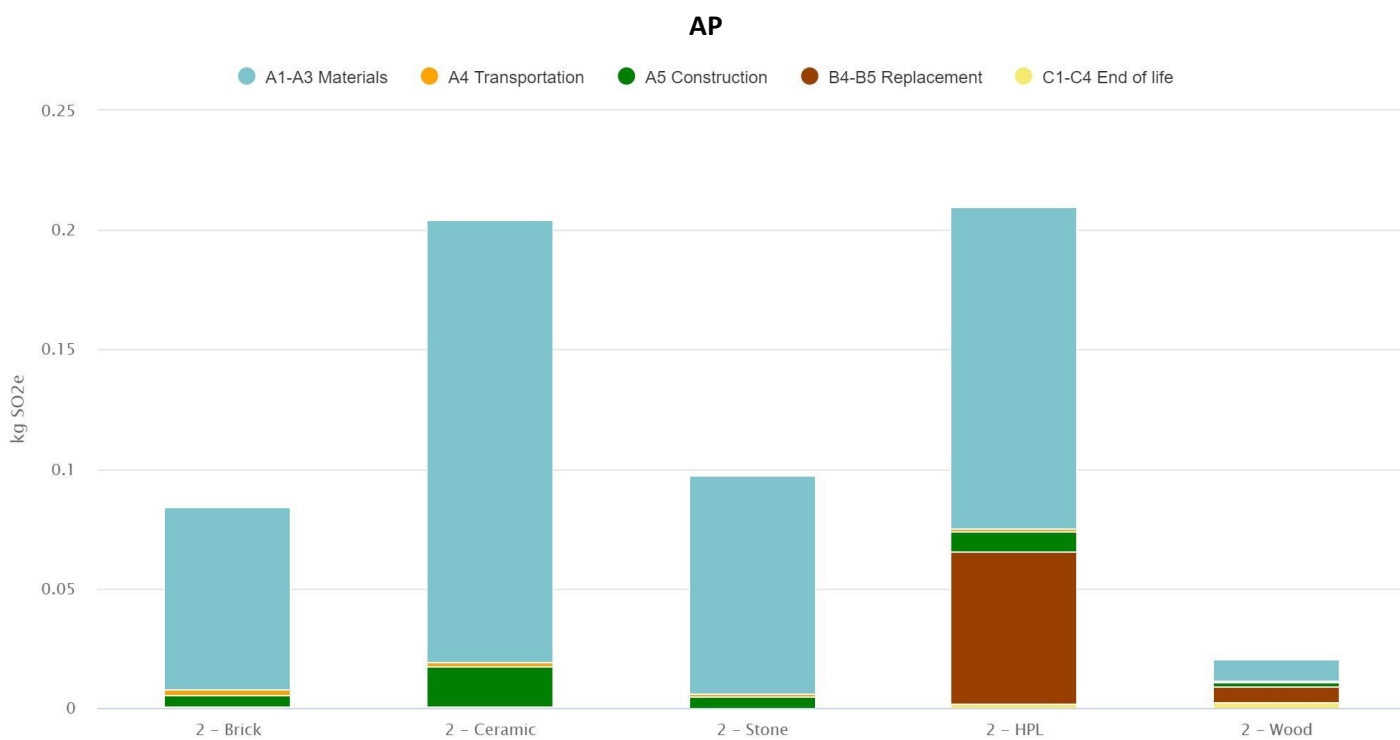
- **HPL:** This solution has the highest GWP. This is mainly due to the replacement that is assumed once during the 50 yr life time.
- **Stone:** Production of this construction has significantly lower GWP than brick, ceramic and HPL options.
- **Wood:** This solution has the lowest GWP value in this comparative assessment. It is interesting that the effect of periodic painting (B4-B5) is relatively important if we check the GWP results of this option.

Other Hotspots

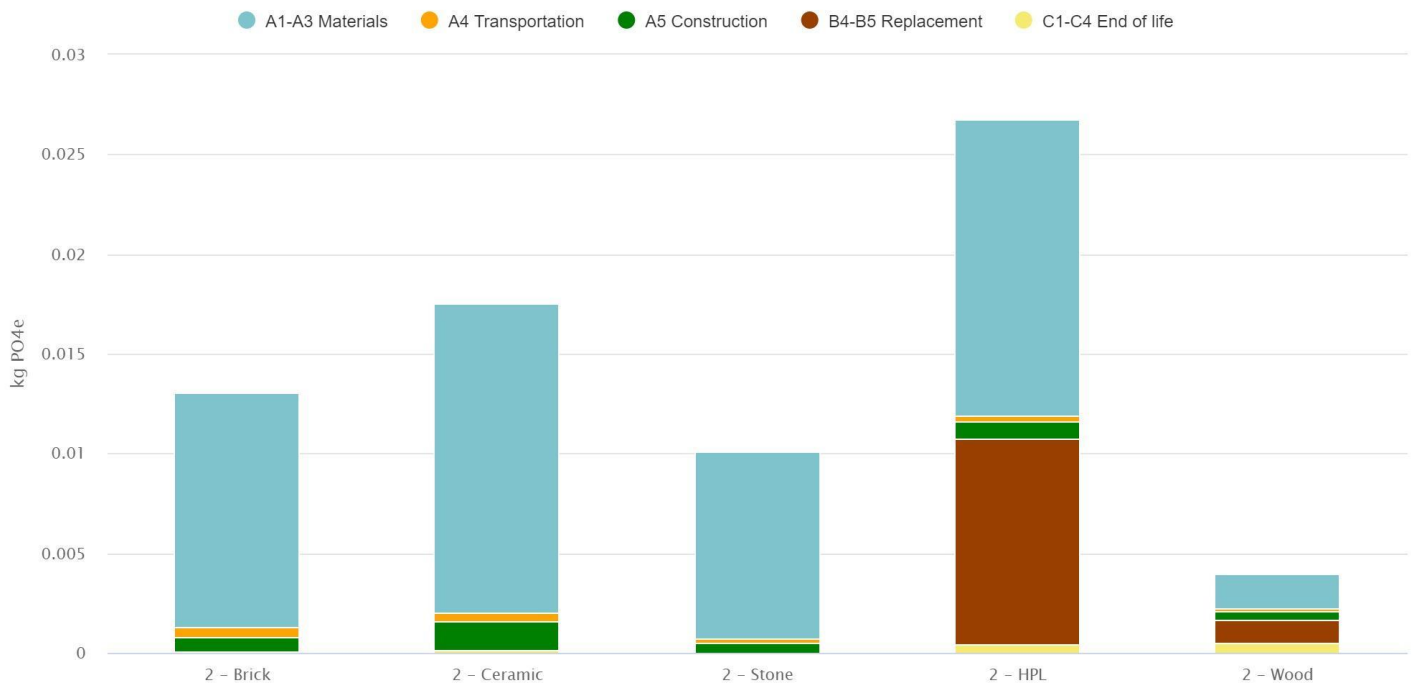
GWP is the most important indicator in the building industry.

However, results of other categories can identify some additional hot-spots or conclusions.

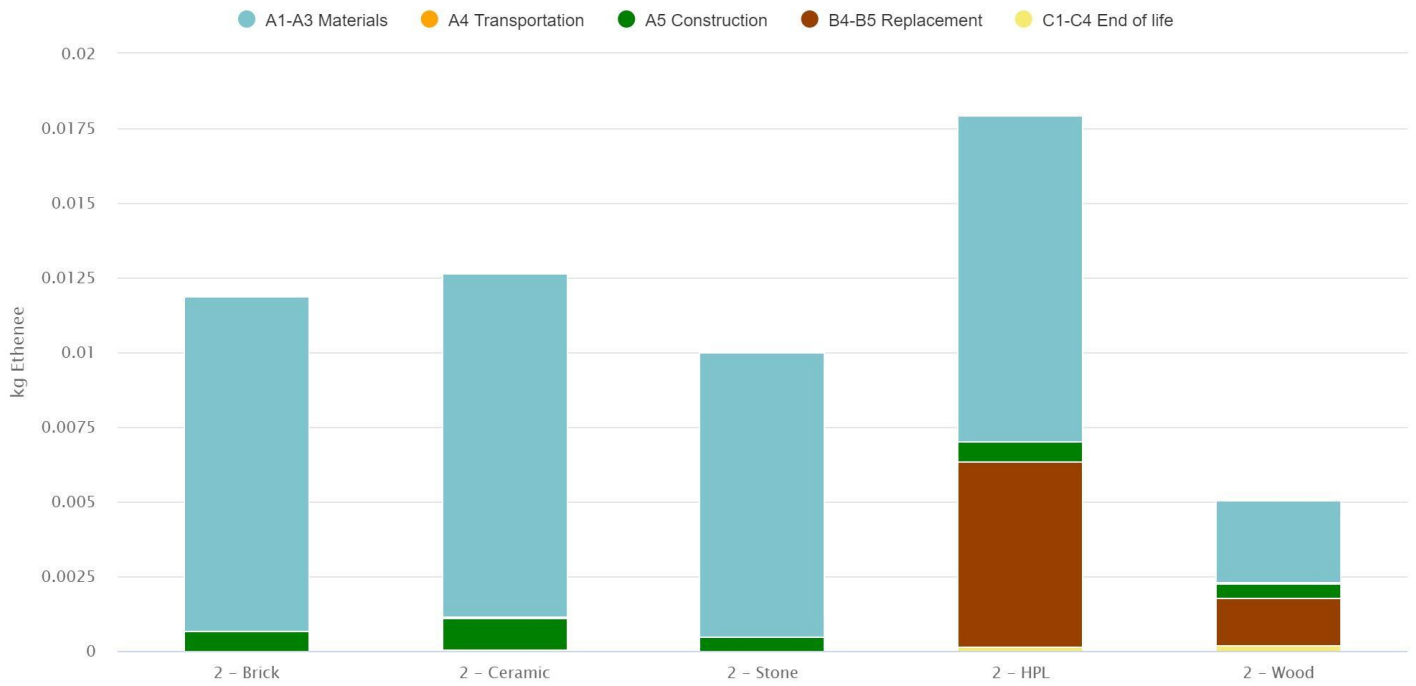
- **HPL:** The disadvantage of this construction is confirmed also in Acidification, Eutrophication and Photochemical Ozone Creation Potentials (AP, EP, POCP) due to the aggregated impact of HPL board and aluminium fixing system and the replacement need.
- **Ceramic:** In AP and EP, this solution appears to be less beneficial than stone and brick solutions. This is due to also the impact of the applied aluminium fixing system.
- **Stone:** This is still one of the best options if we analyse other impact categories even if its benefits, compared to the other solutions, are less significant than in GWP.



EP

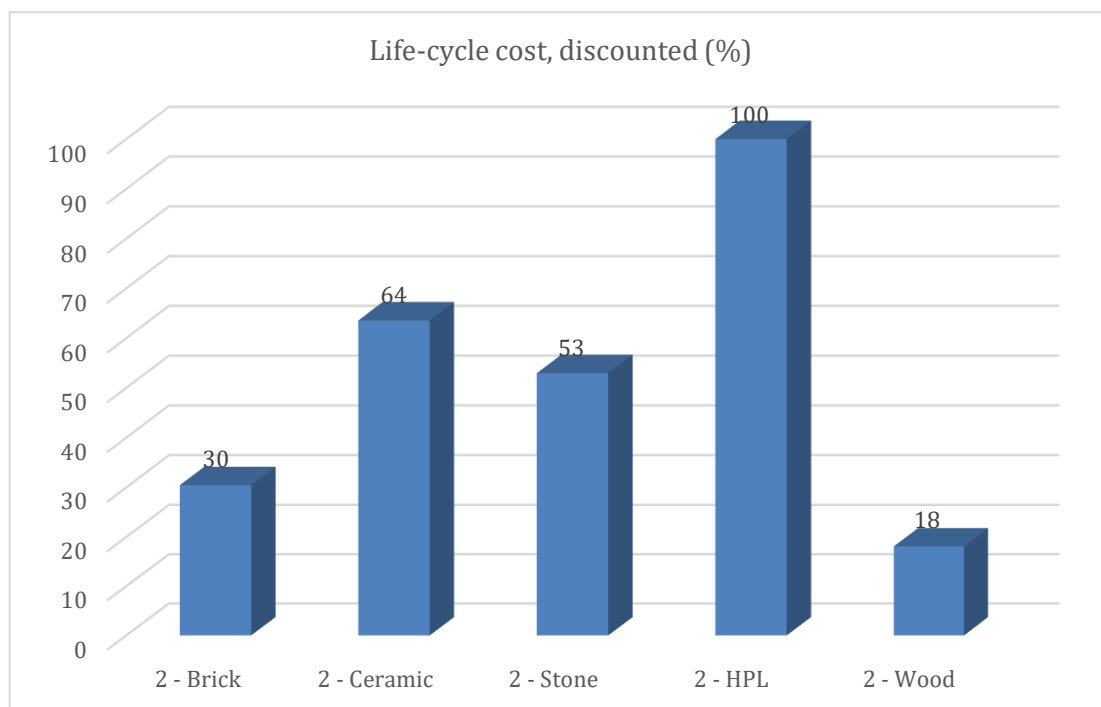


POCP

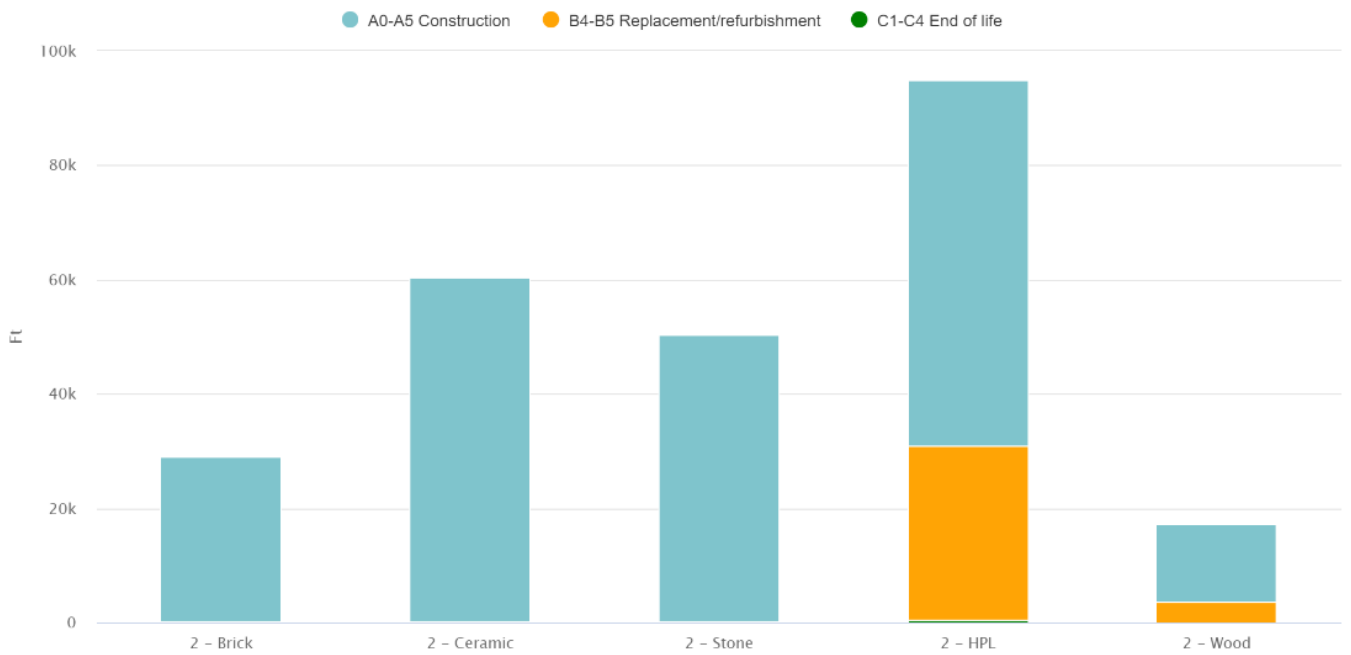


Cost Results

We analyzed the life cycle costs of the 5 different claddings above, based on a 50-year lifespan. HPL cladding was the most expensive and wood cladding the cheapest option. The life cycle cost of the ceramic cladding is about 64% of that of the HPL. Natural stone cladding accounts for 53%, the LCC of brick cladding is 30% of HPL, while wood represents only 18%.



LCC, discounted (HUF)



Due to the renovation of HPL, the cost over 50 years will increase with about 30%, and wood cladding has a maintenance cost, while other cladding does not include renovation, only end-of-life costs appear.