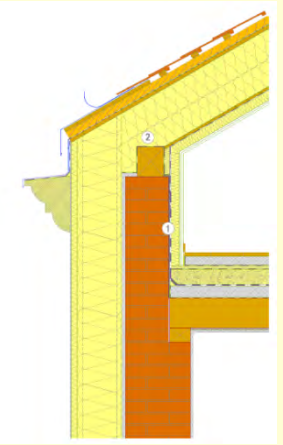
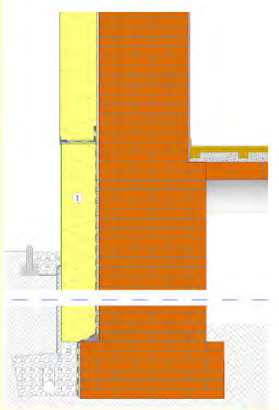
Catalogue of passive house details for refurbishments

[Schweig] Passivhaussanierung
HS Langenzersdorf

- **construction and connection details**
- **Roof space conversion**
- **Basement drainage**
- **Facade renovation**
- **Ecological and hygienic aspects**





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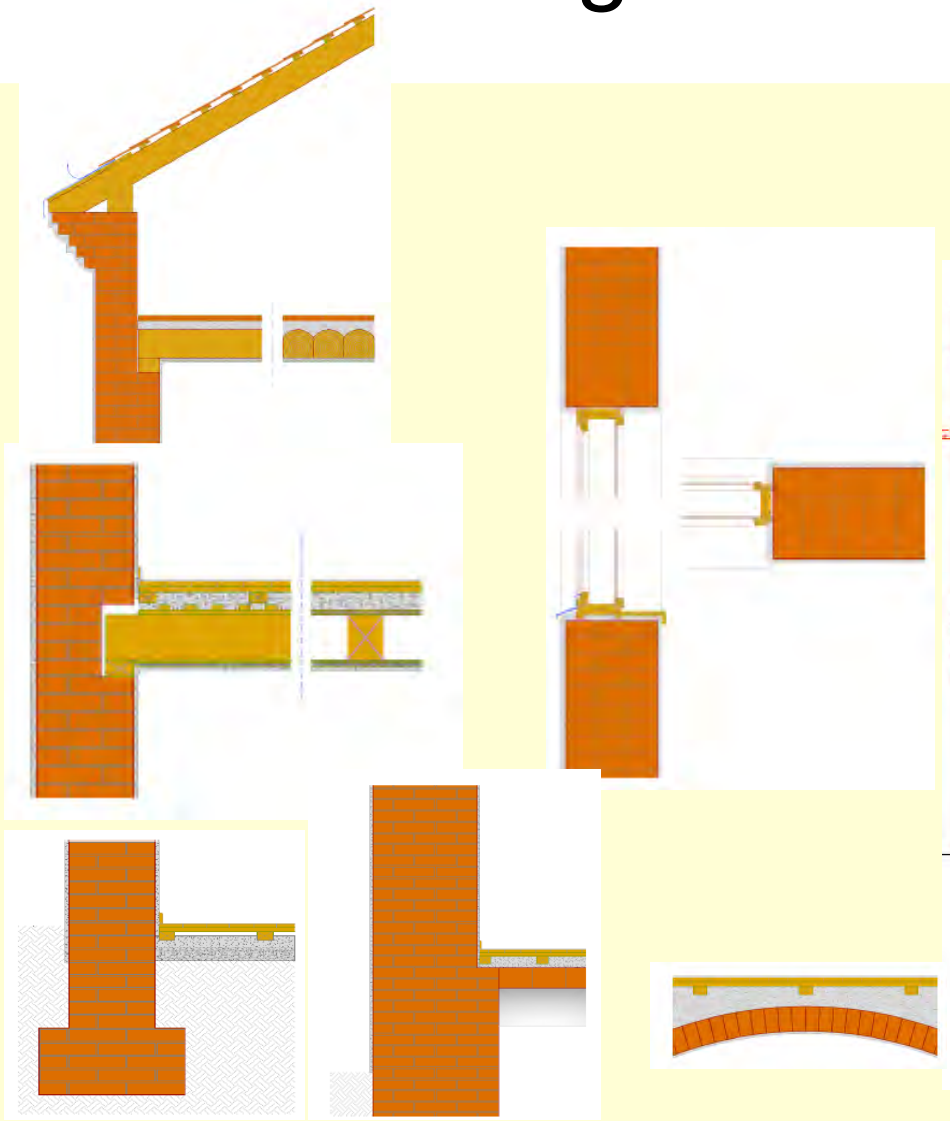
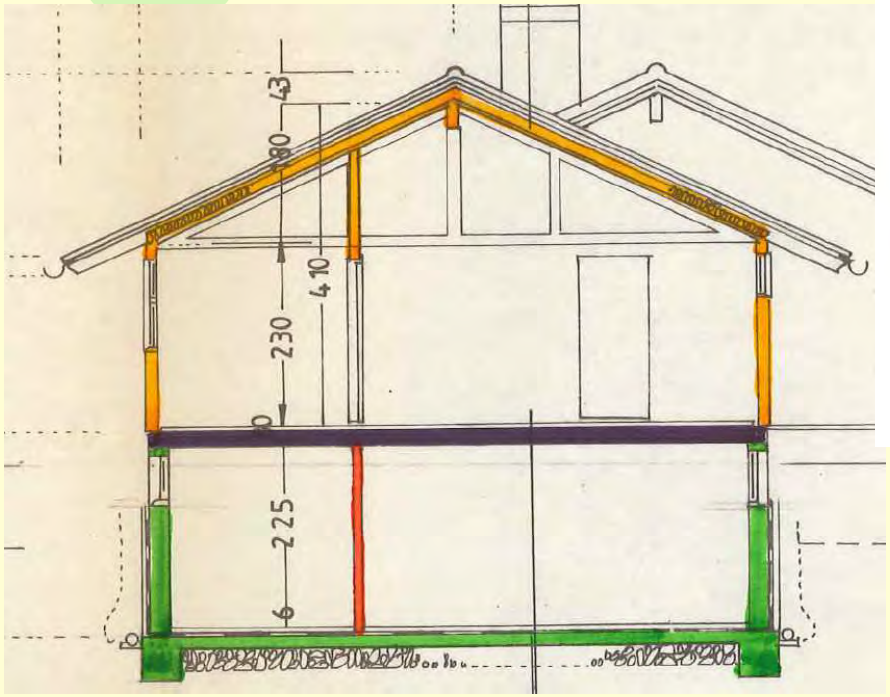
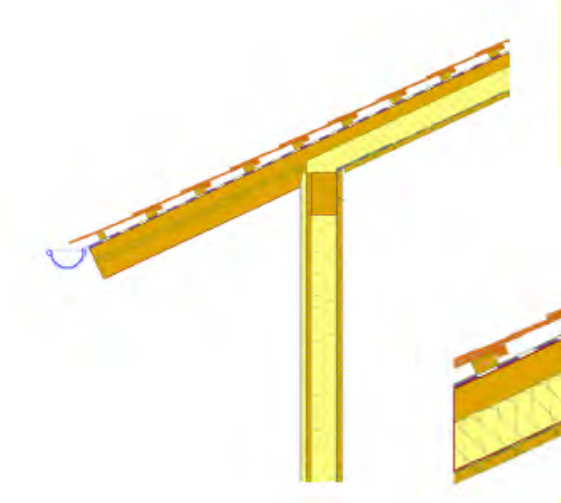
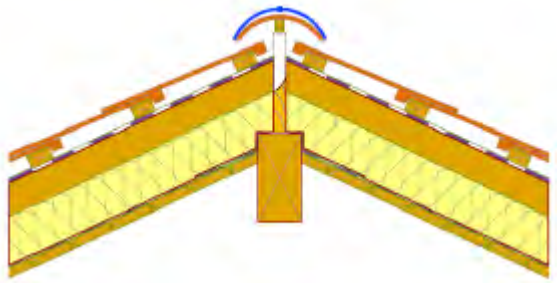
building tasks – Connection details buildings built before 1918

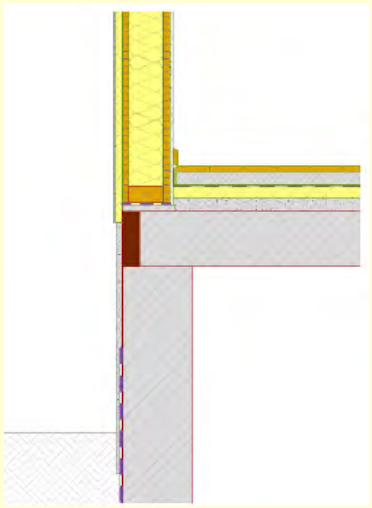


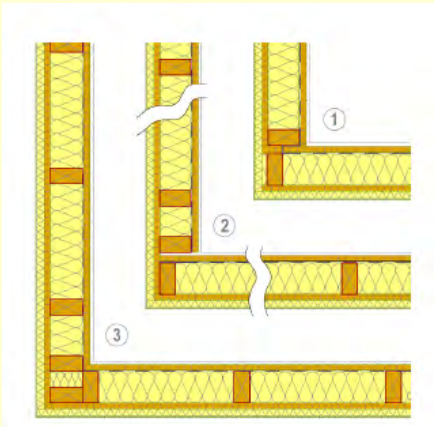
Building tasks – Connection details prefabricated lightweight buildings of the 1980s



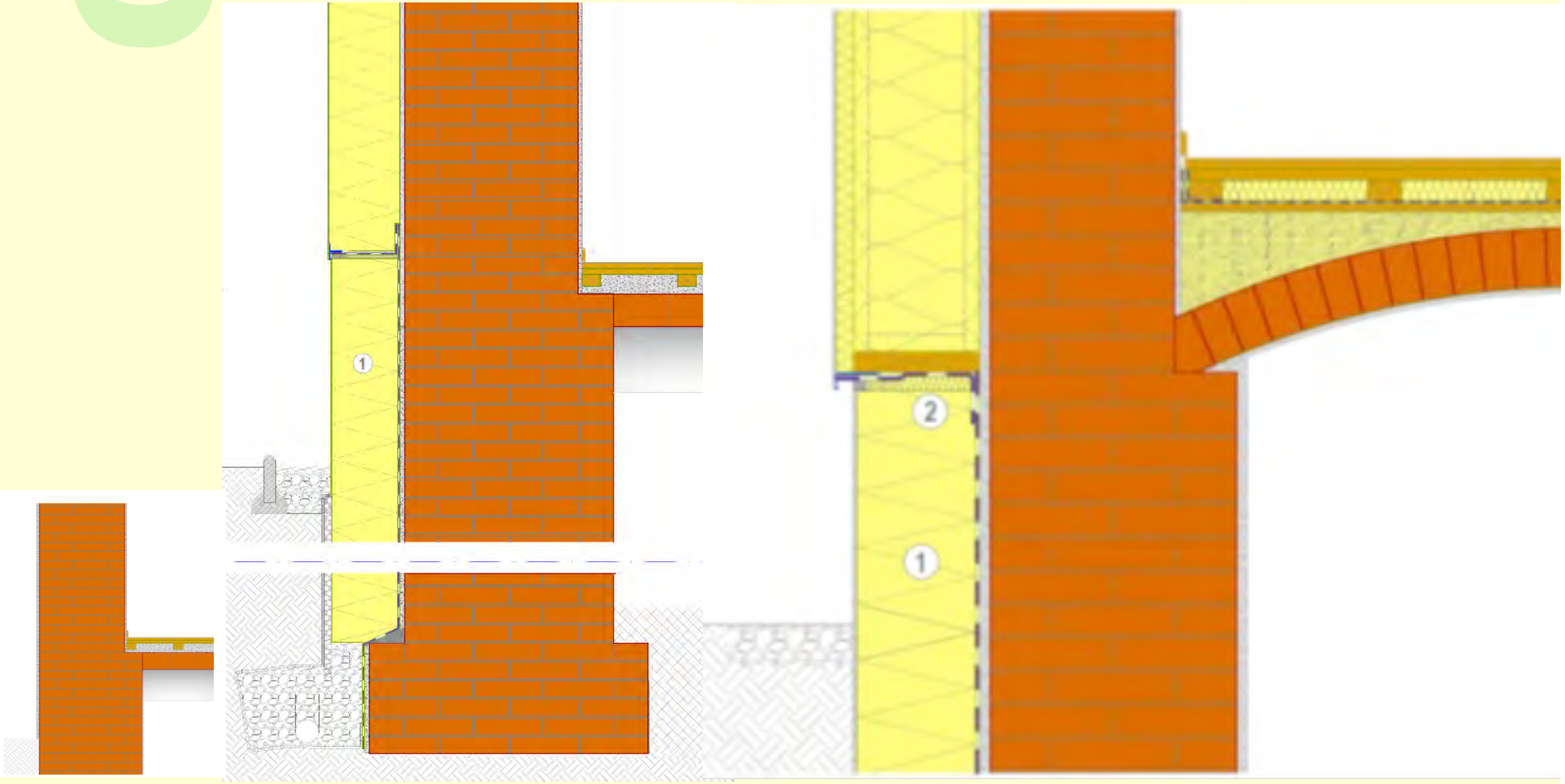




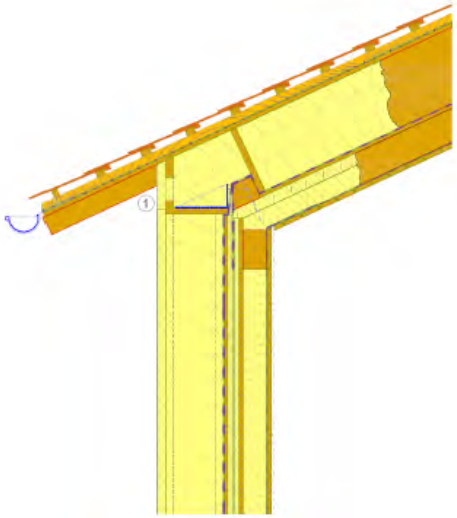


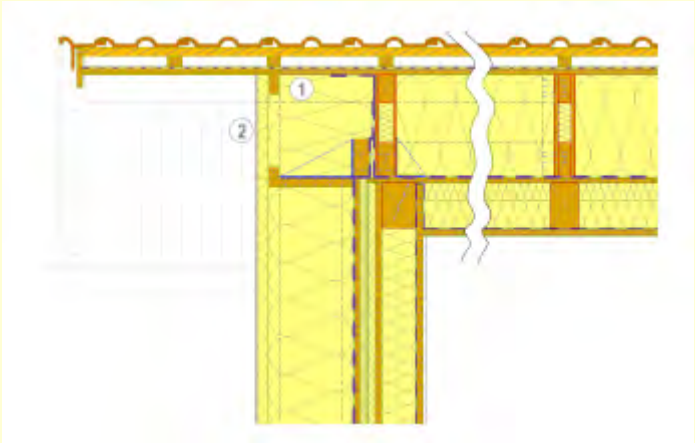


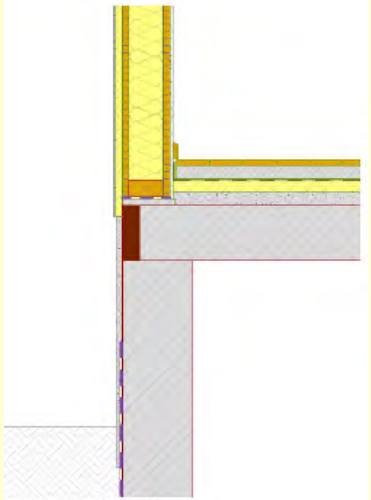
connection details - retrofitted

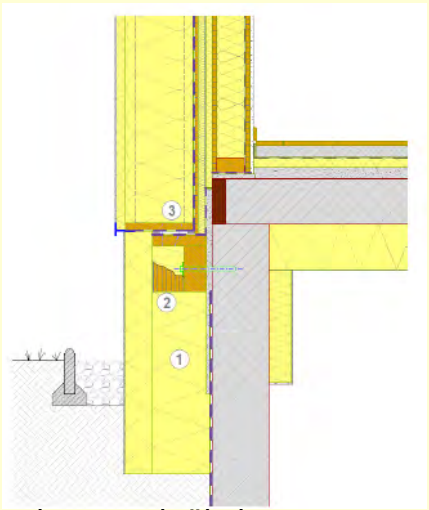


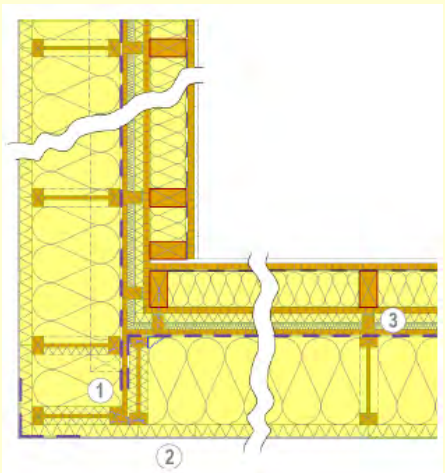
connection details - retrofitted





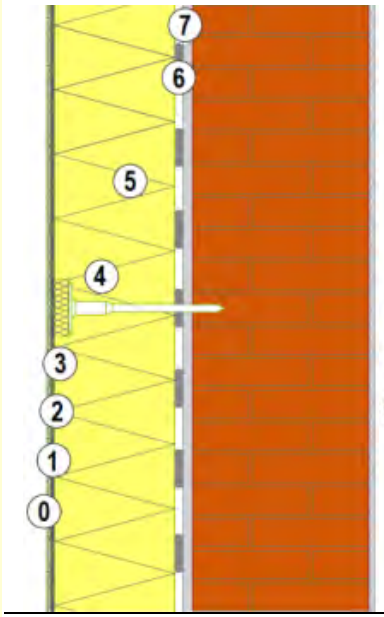




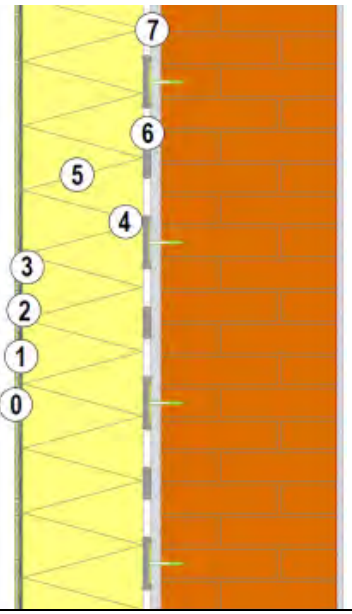


Regular cross sections – external wall retrofitted

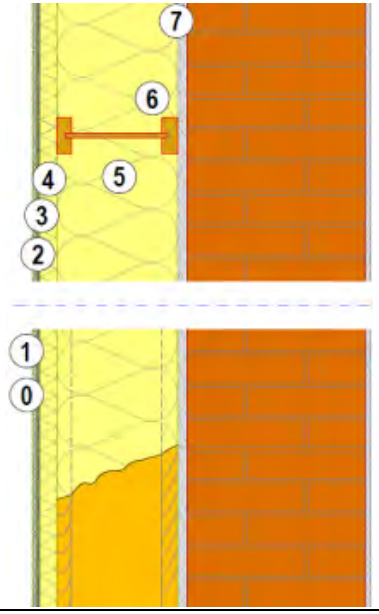
ETICS



Wood construction, built on-site, rear ventilated

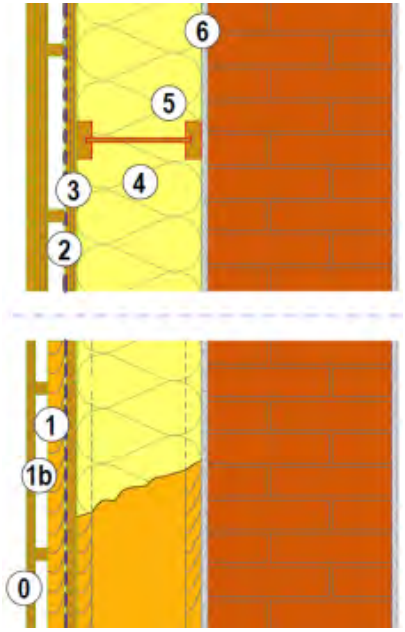


Wood construction built on-site, plastered

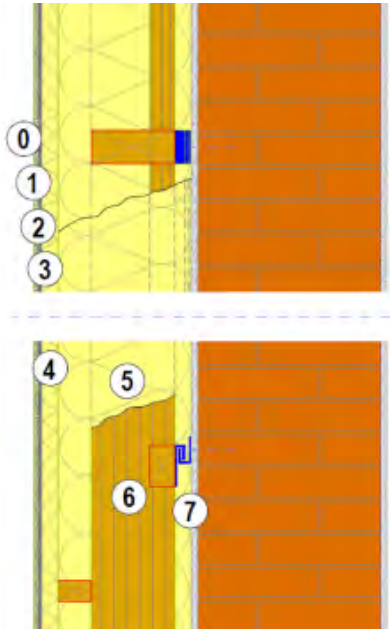


Prefabricated wood construction, insulation material inserted on-site, plastered

Regular cross sections – external wall retrofitted



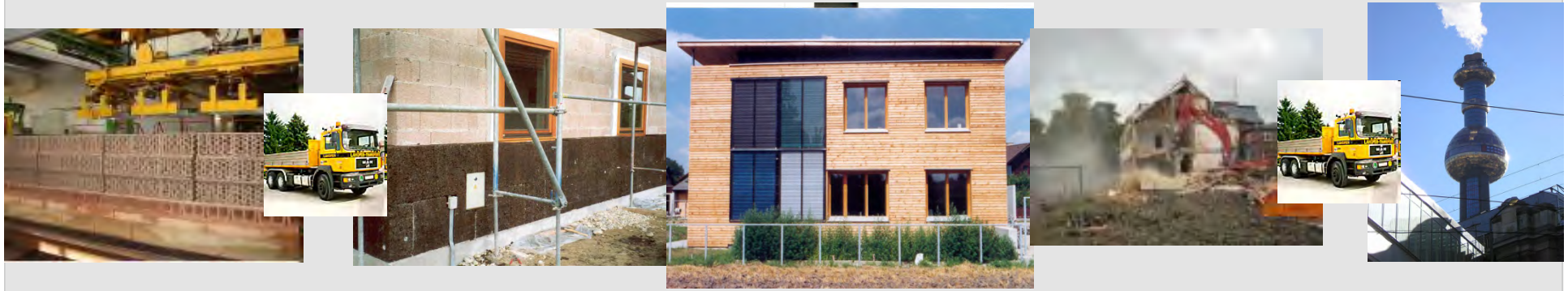
Prefabricated wood construction, insulation material inserted on-site, rear ventilated



Wood construction. Prefabricated including insulation material, plastered

Life cycle of buildings (and of constructions)

Inputs (materials, energy, ..)

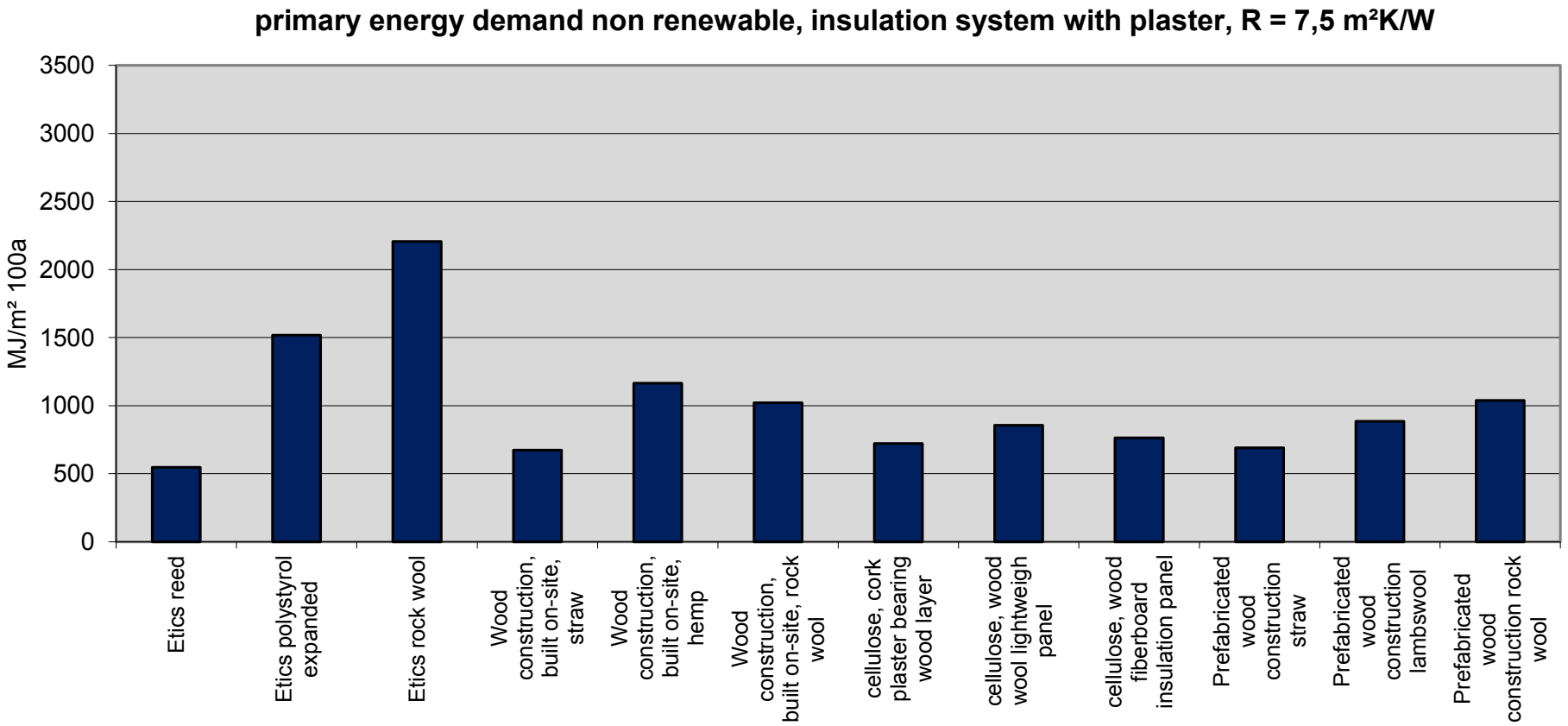


production → installation → use → dismantling → disposal

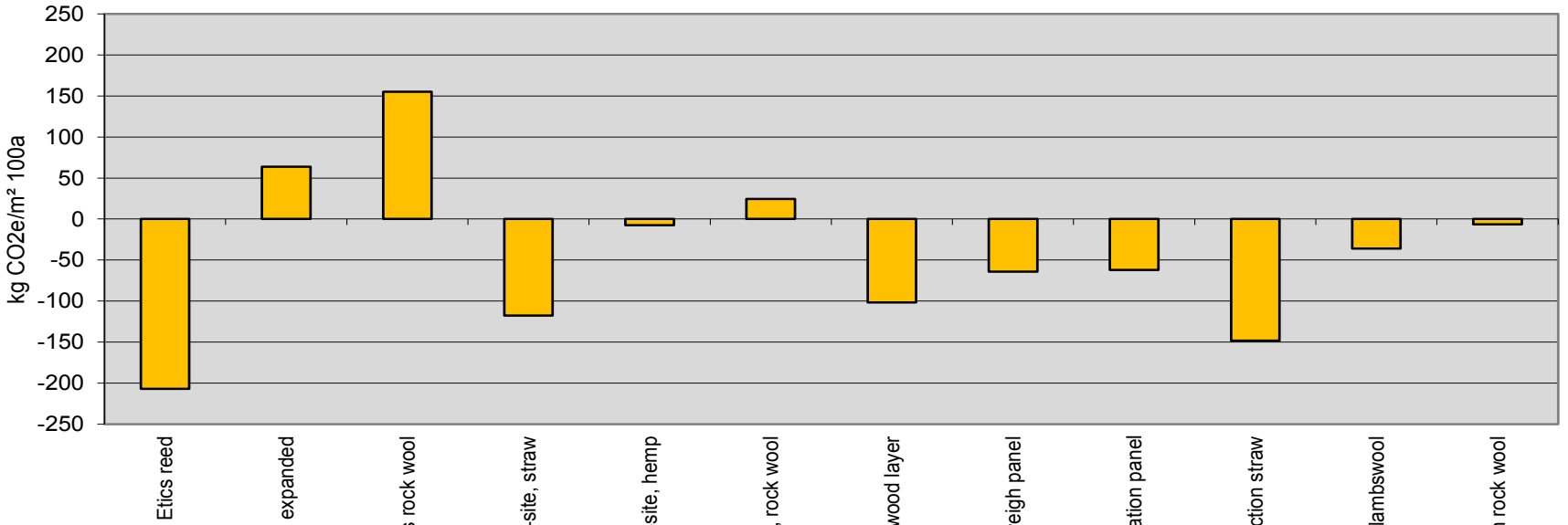
Outputs (emissions, waste, ...)

evaluation guidelines: health compatibility– ecological health compabiliby– conservation of ressources

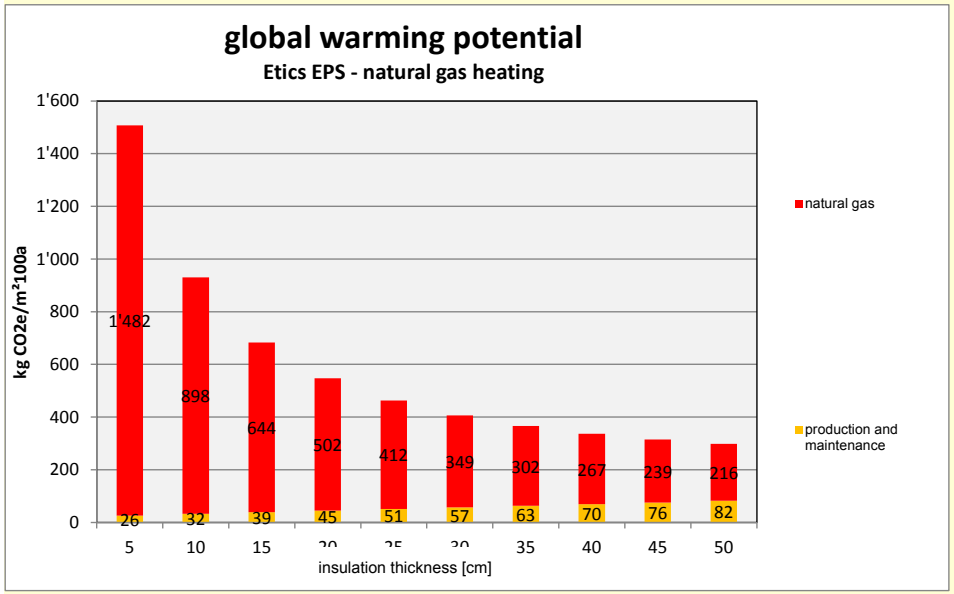
primary energy demand non ren. production and maintenance insulation plastered

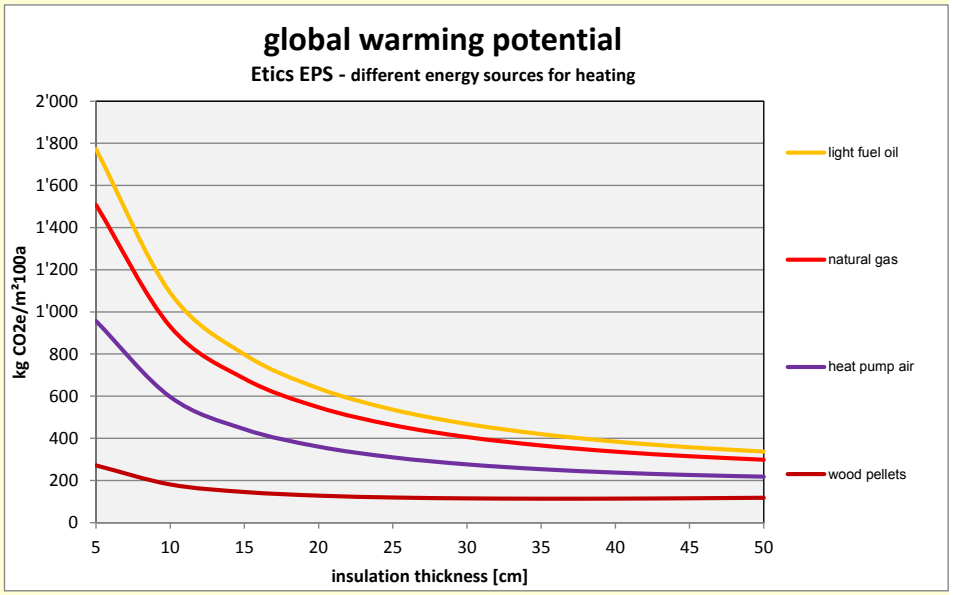


global warming potential production and maintenance insulation plastered



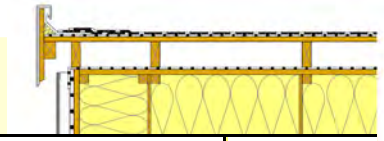
Global warming potential: production and maintenance insulation plastered, + heating



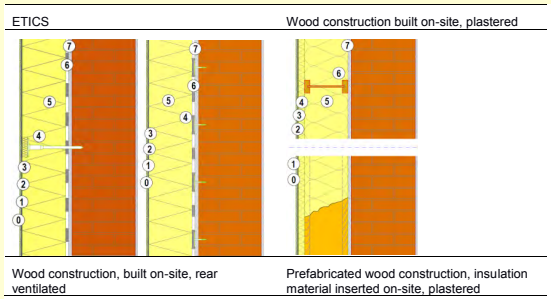


- heating with natural gas
- etics polystyrene plastered

deconstruction, recycling and disposal

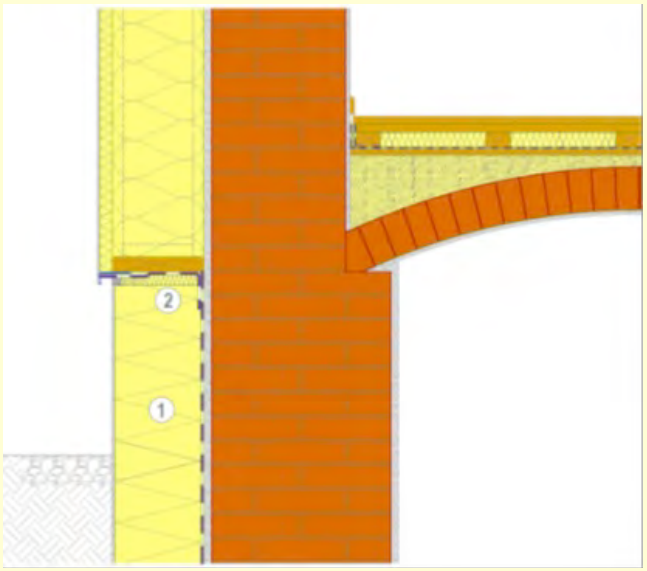


Plastered insualtion system	**Note**
30 cm ETICS with EPS panels (disposal of brickwork due to contamination)	6,7
30 cm ETICS with EPS panels (recycling of brickwork despite of contamination)	4,9
34 cm ETICS with meineral foam panels	3,3
30 cm I-beam with cellulose fibre, plaster on 4 cm wood wool lightweight panel	3,0
30 cm wood frame with wood fibre insulation, plaster on 4 cm wood wool lightweight panel	1,2
Rear ventilated insulation system	**Note**
30 cm cellulose fibre between I beams with wood shuttering, wood façade on wood lathes	2,6
30 cm cellulose fibre between wood construction1	1,1
30 cm EPS panels fixed with anchors, mounted with dowels in the brickwork, aluminum facade on aluminum substructure	2,0



High grade refurbishment with improvement of basement climate

insulation cellar ceiling



low moisture penetration higher moisture penetration

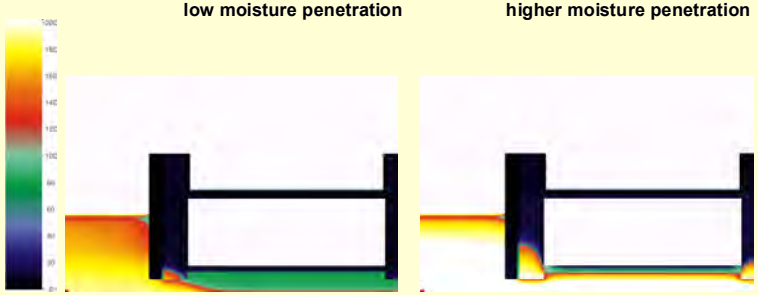
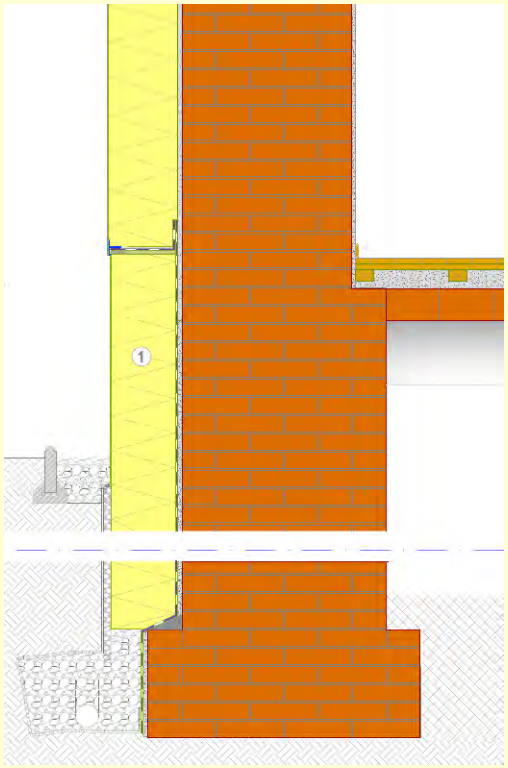


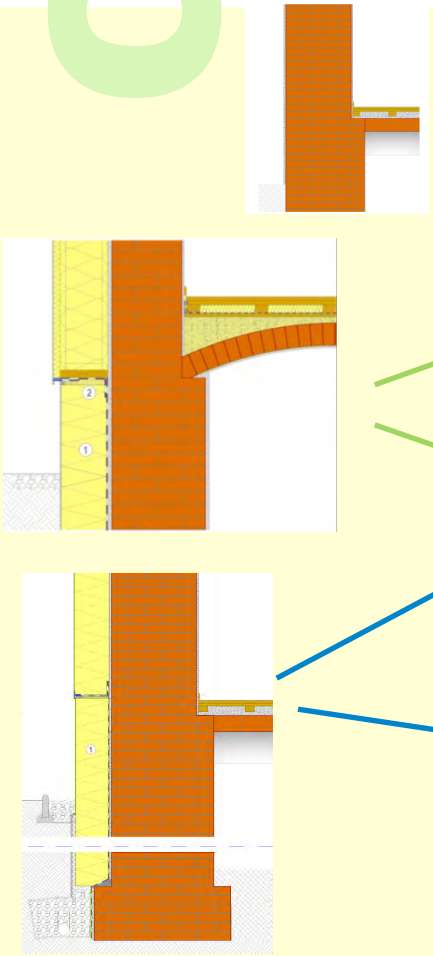
Fig 6: Water content [kg/m³] with lower or higher moisture penetration and an air exchange of 0.1/hr (1 January)

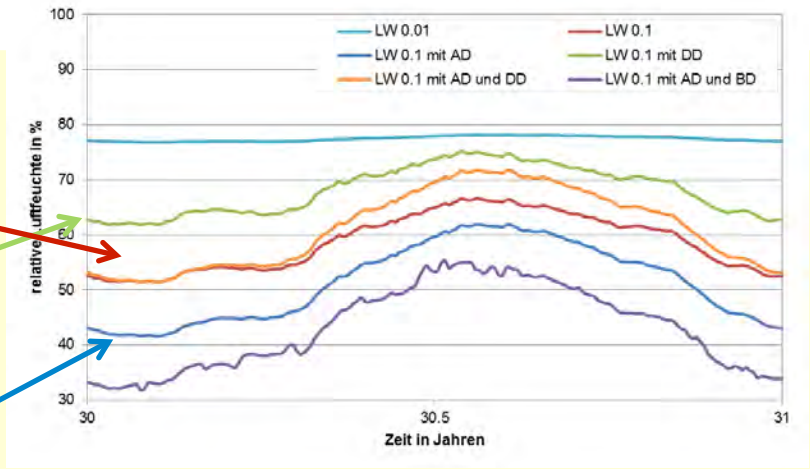
umbrella insulation



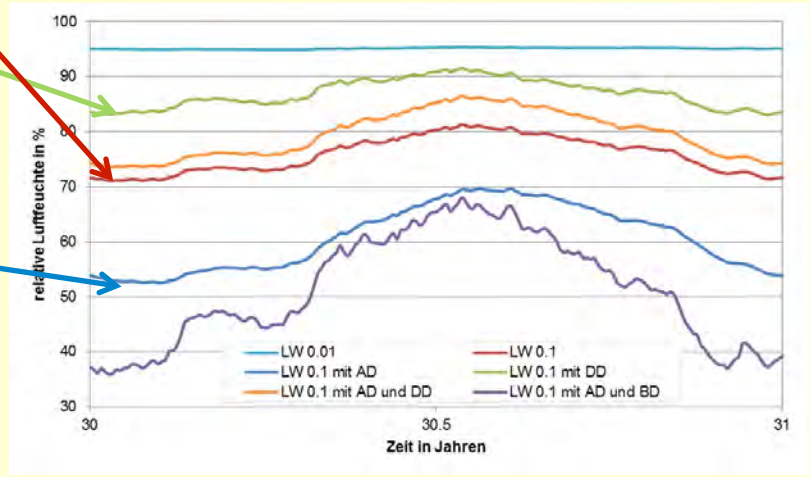
3Dim hygrothermal simulation HAM4D (TU Vienna)

basement climate - humidity



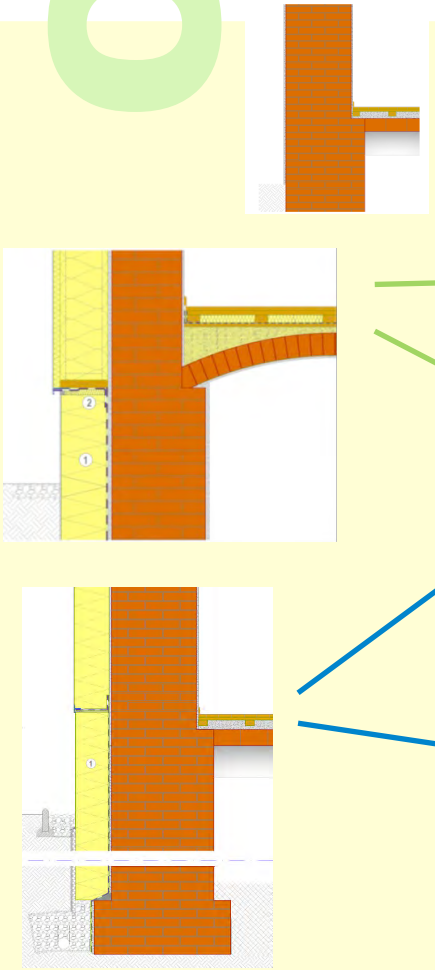


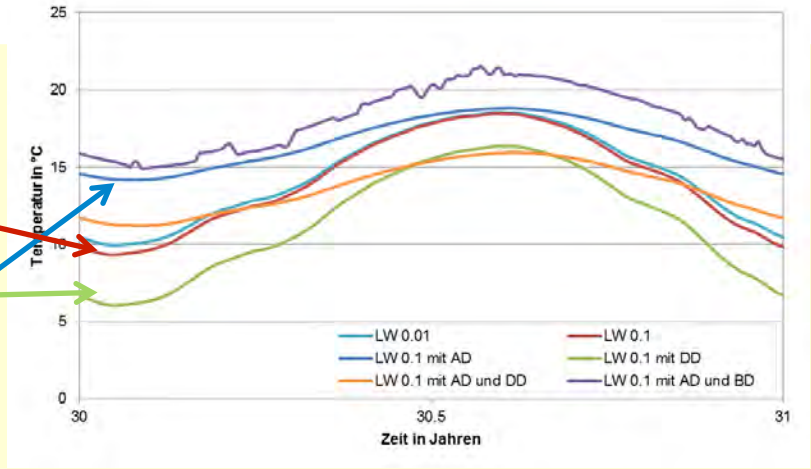
low moisture penetration



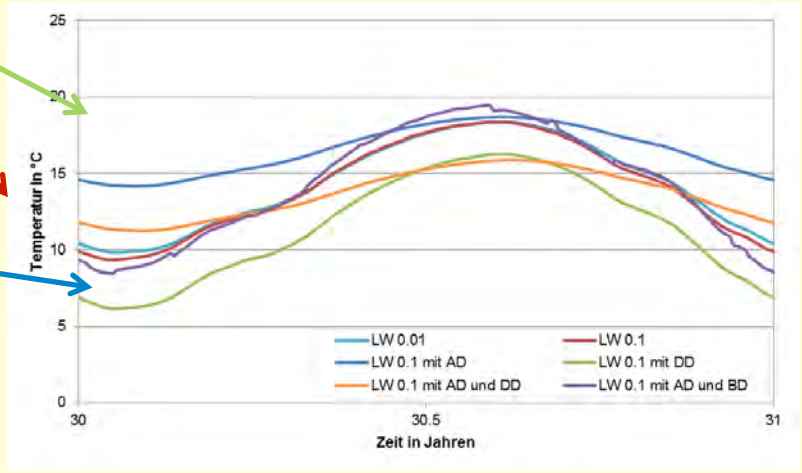
high moisture penetration

basement climate - temperature



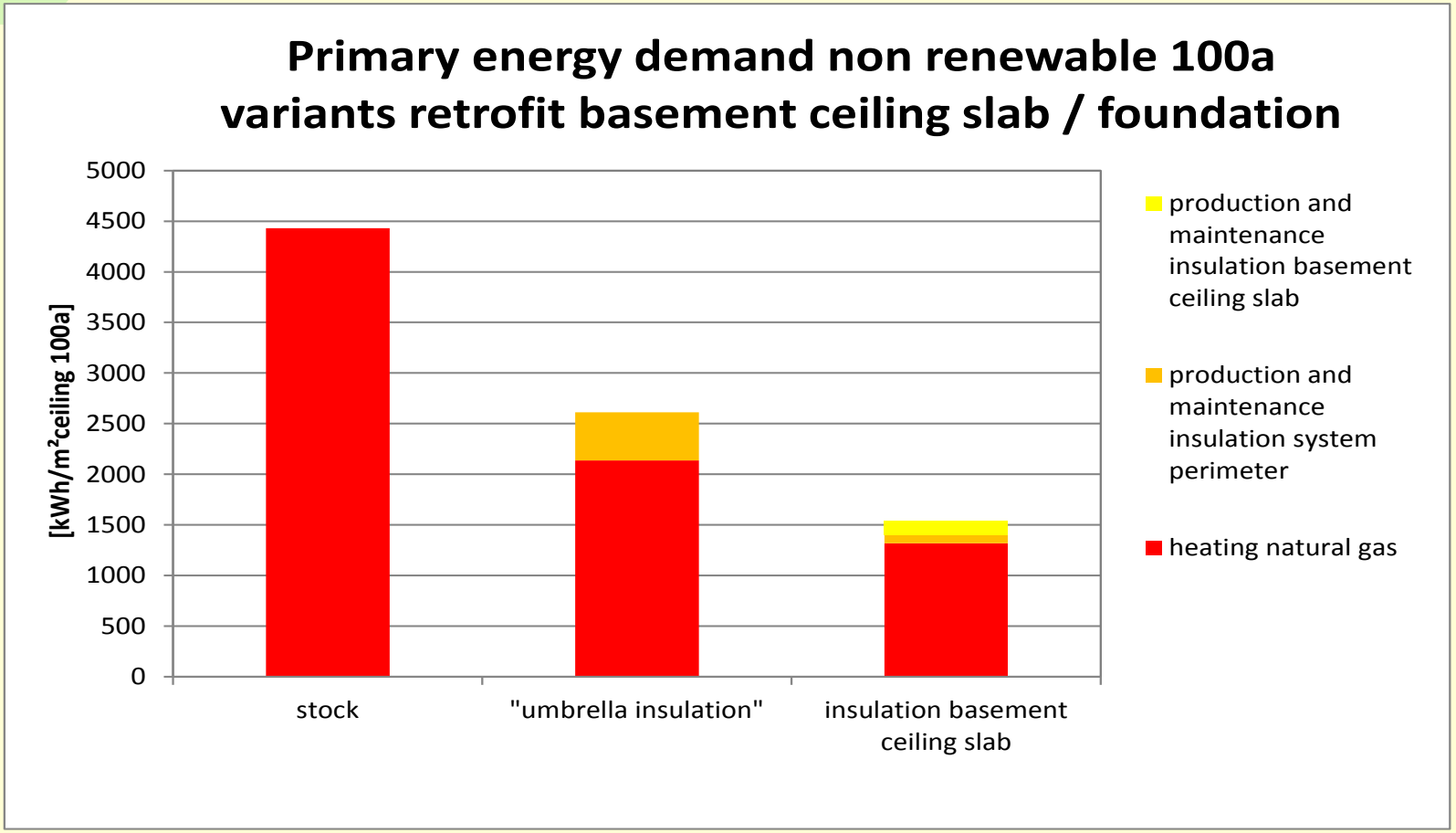


low moisture penetration



high moisture penetration

Ecological Evaluation



Thank you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