



FP7-ENERGY-2013-1

Research and development of innovative solar thermal facades

FLUIDGLASS

Solar Thermal Glass Facades with Adjustable Transparency

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Intermediate LCA report

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Executive Summary

Because many components of the FLUIDGLASS are still under development, the ecologically based LCA can only give tendentious assessments so far. For the FLUIDGLASS-LCA a method is established, the system boundaries are defined, an inventory analysis for the so far know components are made and first impact assessments are done.

Preliminary outcomes are:

- With the current design no hazardous substances according to the LCA standards were identified. Further investigations have to be performed for the fluid when the fluid is defined.
- The primary energy demand of the FLUIDGLASS façade within the production stage and the component replacement within the use stage over the whole life cycle of the building will be approximately up to 50% of the energy demand for cooling and heating within the use stage. The selection of the FLUIDGLASS components has a great influence on the overall balance of the FLUIDGLASS facade.
- A FLUIDGLASS façade requires almost the same primary energy as the comparable reference scenario – sun protection glass façade, façade integrated solar thermal collectors and heating and cooling ceiling, if both production and component replacement are considered during the 50 years life-cycle.
- First rough comparisons with the reference scenario also show the importance of the colorized option of the FLUIDGLASS. Only by dyeing the fluid, the energy demand and thereby the ecologically impacts of the FLUIDGLASS will be less than the benchmark scenario.
- The selection of the antifreeze fluid additives has a great influence on the LCA. Propylene glycol has a significant environmental impact, especially if it is replaced every 5 year. It will be one of the focused points in the further research.

The FLUIDGLASS LCA needs to be an accompanying process during further developments of the FLUIDGLASS research. The inventory analysis will be updated with the defined components and simulation results from Task 4.3 and 4.4 will be implemented. Feedback will be given during the research process to the partners.

The economical LCA allows at this early stage of the project only for a very rough calculation of cost. It is however possible to put the savings in energy cost achieved by the use of FLUIDGLASS into perspective when comparing it to the cost for the actual hardware. What becomes clearly visible is that, the savings generated by the superior energy consumption are at least one order of magnitude lower than the current surplus in product cost. This means for the further course of the project that cost needs to be given even higher attention.