# Sustainable roof glazing systems by using thin glass in multi-pane insulating glazing units

TECHNISCHE UNIVERSITÄT DARMSTADT

ISM+D
Institute of Structural Mechanics and Design
Institut für Statik und Konstruktion

## Masterthesis
## Research area: sustainability and structural glass design

**Research topic:**

Issues regarding ecological, economic and social sustainability are pervasive topics in society and are also increasingly affecting the construction industry. In structural glass engineering, the increased use of thin glass represents a decisive development trend with the purpose of reducing glass thickness and thus material usage and weight. Here, the use of thin glass in insulating glazing units (IGU) in window and facade construction offers a promising approach. In this context, the exposure to wind and snow has to be considered in order to ensure that possible products meet the safety requirements in the building sector. Within the scope of the work, these influences are to be investigated in order to determine the required minimum thickness of the glass, depending on different IGU formats. Based on these insights, the $CO_2$ savings potential is of interest and needs to be calculated. Consequently, the questions that are relevant in the course of this thesis include:

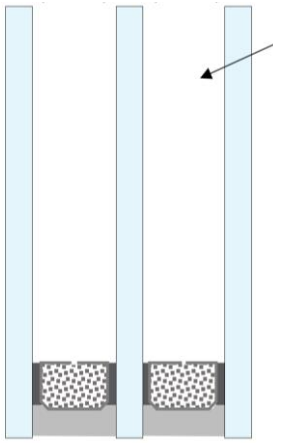

Bild: Triple IGU

- How much glass is needed in the construction industry and what share can be attributed to the use of IGUs?
- What is the carbon footprint and energy use in the production of glass depending on possible refinement levels of IGUs?
- And in particular, how much $CO_2$ savings potential lies in the use of thin glass as the middle pane in IGUs?

**Focus topics:**

- Literature review on environmental and economic sustainability in glass construction
- Determination of technical requirements for the integration of thin glass in IGUs
- Data-based investigations on $CO_2$ savings potentials for thin glass integration in IGUs
- Derive practical application strategies for thin-glass integration in IGUs

**Comment:**

- Preferred language: English (German also possible)
- The thesis will be in cooperation with the company Velux
- Visit of the company Velux in Denmark is possible

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