



## Research into the Energy Efficiency of Glazed Buildings

### Project Summary

We joined forces with the Lund University of Technology and Skanska Sweden to research the energy efficiency of glazed office buildings. We did this to enhance knowledge about the construction of office buildings where glazed façade systems are preferred.

### The Client's Challenge

During the nineties, office buildings with glass facades were popular for their transparent appearance and ready access to daylight. More recently the application of double skin glass facades has seemed to offer better insulation and more efficient solar shading.

Although double skinned glass facades have been applied with success in recent years in Scandinavia, little was known about how these systems performed in the Swedish climate. The challenge is to build energy efficient glazed office buildings, which are still visually attractive, comfortable for the user and make better use of daylight.

### Our Work

#### A Virtual Approach

We saw this as a challenge with two possible methods of approaching the research : study current buildings... or create a new one.

We created a 'virtual' building to provide a reference and to simulate the environmental performance of typical construction methods. The building construction, HVAC system and control system were carefully selected and programmed.

Different scenarios were tested. We varied the building's orientation. We tweaked the architecture. We remodelled floor plans. We played with control set points and glazed facade elements such as window type and size and shading devices.

A sensitivity analysis was based on the simulated alternatives to assess the building occupants' thermal comfort and the energy efficiency of the building itself.

### The Outcome

The research proved that a thermally comfortable building which made best use of natural daylight could be achieved with a double skin glass façade. The technical specifications and results helped develop guidelines for double skin facades via the BESTFACADE project, funded by the European Commission (IEE).

All parties involved in the project will benefit from this valuable information, including manufacturers Saint-Gobain and Pilkington and the Swedish Glass Trade Association (Glasbranschföreningen) who supported this research and provided assistance.

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