SUMMARY OF THE THESIS

RENOVATION USING PREFABRICATED FAÇADE ELEMENTS

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The building sector consumes about 40% of the world's total energy resources. This is high and undesired. As a result, Sweden aims to target this issue. Sweden aims to reduce the energy consumption in both residential and commercial buildings. To address this challenge, the European Union partnered with the Swedish Environmental Research Institute (IVL) and lunds Kommuns Fastighets AB (LKF) for a pioneering project in Lund's Linero district. This master's thesis is an integral part of that initiative.

This study primarily focuses on a comprehensive review of existing literature. Furthermore, this thesis investigated the qualitative value of potential solutions that could reduce the energy consumption used by the building sector. Different softwares such as WUFI and HEAT2 were an integral part as these programs allow qualitative measurements and calculations on moisture content and thermal bridges, respectively. Furthermore, AutoCAD was also used for making detailed drawings of the potential innovative solutions. The objective of this thesis was to identify an advanced, industrialized façade method capable of enhancing the insulation of existing building facades, thereby reducing the total energy consumption for the building sector. Additionally, the thesis explores the potential for introducing innovative prefabricated façade elements into the Swedish market; specifically, for renovating the Million Programme of the Linero project.

The study scrutinized numerous facades available in the European market; as a result, a top selection was gathered of the 15 promising prefabricated facades in the European market. These 15 promising prefabricated facades were analysed and compared to determine the best fit for the Swedish climate. After thorough investigation three prefabricated facades from the European market were selected as most promising for the renovating the Million Programme of the Linero project.

To evaluate these options, the study employed various software tools such as WUFI, AUTOCAD, and HEAT2. Comprehensive analyses encompassed moisture risk assessment, attachment and fixation to existing structures, and thermal performance. While all three facades demonstrated commendable results suitable for future Million Programme renovations, one of them emerged as the top performer.

Keywords: Energy consumption, Energy reduction, EU collaboration, IVL, LKF, TES façade, Multi-active façade, Alingsås façade, Million Programme, Moisture risk analysis, Attachment, Thermal performance, WUFI, AUTOCAD, HEAT2.