



Study of the impact of design parameters on a BIPV system

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Introduction

In the field of solar photovoltaic panels, one of the more important aspects is the way these panels are installed. Building Integrated Photovoltaics (BIPV) are a technology to address this area, specifically for buildings. This technology uses panels that have been specifically constructed for the roof or the building part that it is attached to. Rather, the panels are as much a part of a building as the walls and windows; that's how well they are 'integrated'. For the purpose of this project, a specific system called the Lightweight Rooftop BIPV (LiROB) will be studied.



The facility, which is a result of this collaboration, is called SolarBEAT and is located on the Vertigo Building at the TU/e. There are 6 different systems at the facility. The LiROB system at the TU/e is a small scale model of a house that may use this system at a larger scale.

Research Objectives

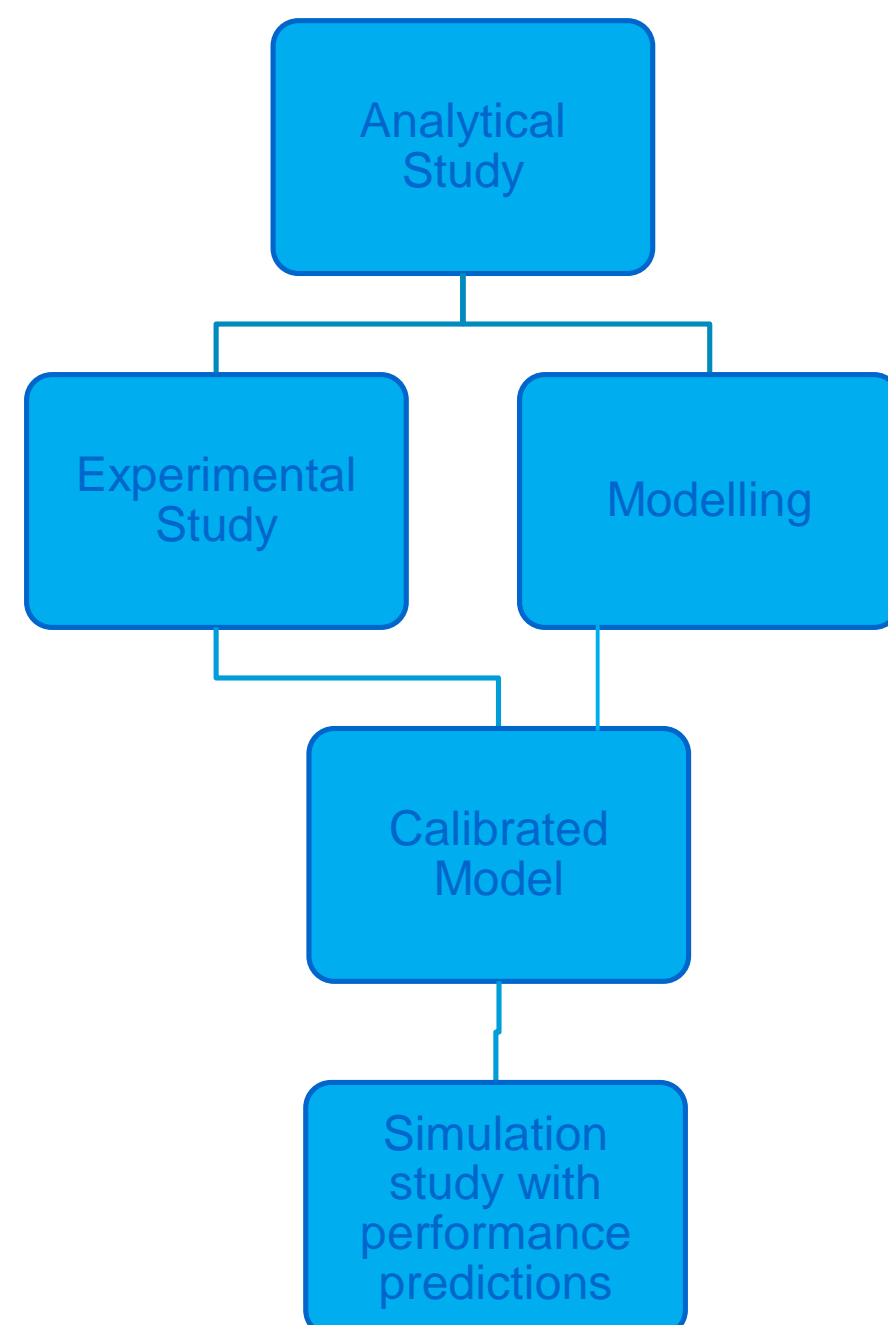
The main objective of this project is to study the impact of relevant design parameters on the performance of a BIPV system. In this project, this will be carried out using three methods:

- Analytical
- Experimental
- Numerical or simulation

The following research questions will be considered as well in order to achieve the main research goal.

- How is the performance of the panels affected under different environmental conditions?
- Under what conditions is the extraction of heat the best?
- How does the change in air gap affect the performance?

Methodology



The analytical study would help determine relevant design parameters that affect the performance of the LiROB system. Then, experiments can be performed on the system to verify these effects and also to study other effects based on the understanding derived from the analytical study. At the same time, a model of the system can be made (using TRNSYS), which can be simulated. After calibrating the model, it can be used to make some performance predictions, which may be out of the scope of the real LiROB setup.