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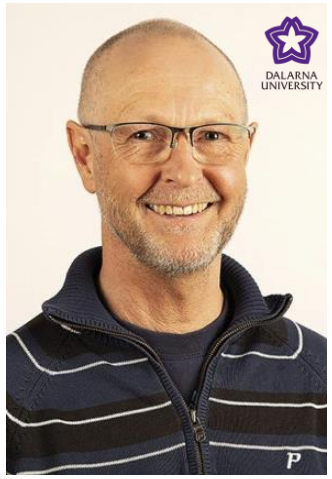
Doctoral Programme in Energy Systems in the Built Environment



Main Supervisor
Chris Bales

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Doctoral Programme in Energy Systems in the Built Environments

Energy as a resource in buildings is seen from a life-cycle perspective in the design of energy system solutions that are sustainable in the long term.

In the subject, emphasis is on energy technology installations located in the built environment, which includes solar energy installations.

Image: Borlänge Nya Campus, Archus arkitekter

Ongoing research topic

Modeling of (BI)PV

Verification of IDA ICE 5 PV simulation & comparison to industry standard PV design tools

- Industry standard tools (eg PVsyst, PVsol, Polysun) do not cover building-PV interaction well
- With measured data from RISE module temperature and power output)
- Initial results promising

Research question:

Can IDA ICE accurately replicate the performance of real-world PV installations across a diverse range of system configurations in Sweden?

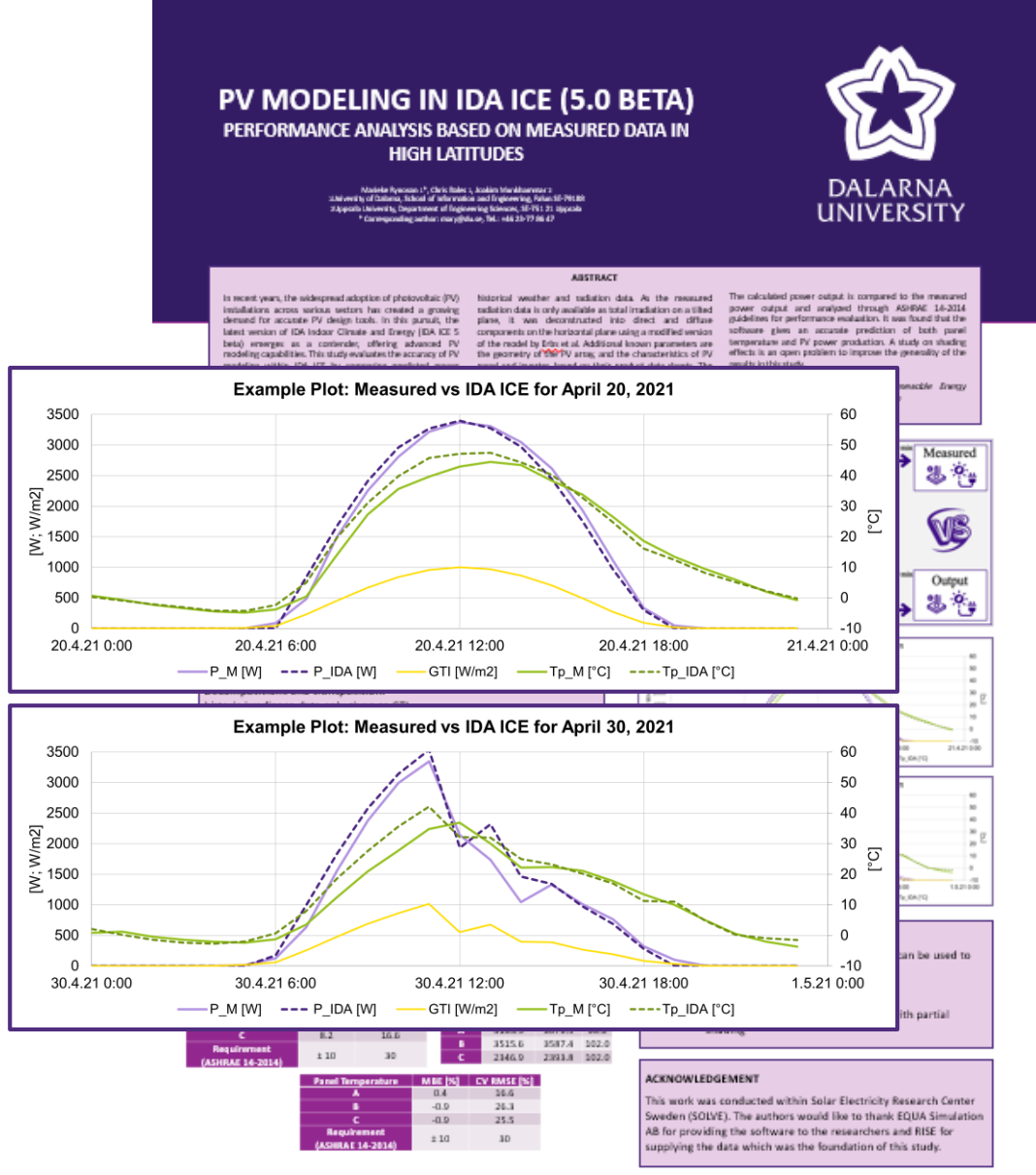

Image: Stuguns nya kyrka; Ellenor Ågevall, Vision.se

Ongoing research topic

PV & Churches

Research question:

"How do **PV panels change the perceived heritage value** – economic, environmental, social – of a church as a specific type of heritage building?"

Method: Qualitative interview study with t.ex. Antiquarians

Planned research topic

Modeling of (BI)PV

Modeling of colored PV

- Based on measured data

Prelimninary research question:

How do different types of PV coloring technologies perform at different tilt angles and how can this be implemented in PV design softwares?

Image: RISE (Borås) with Kromatix PV panels

Planned research topic

Perception of BIPV

BIPV is not just integrated into a building, it is also integrated into people's visual environment and daily life.

Which types of (BI)PV are deemed the most desirable?

Preliminary research question:

Which design strategies can be employed to **enhance public acceptance** and appreciation of PV installations in the urban environment?

Image: Architektur trifft Klimaschutz: Solar Decathlon zeigt Städte der Zukunft - blickfeld - Die CampusZeitung für Wuppertal (blickfeld-wuppertal.de)