IES Ltd Case Study Passive Design / EnerPHit Study at King's Buildings

Energy & Water Management
Support Network

About IES

- IES was founded 27 years ago and headquartered in Glasgow is recognised as a world leader in 3D performance analysis software that is used to design tens of thousands of energy efficient buildings across the globe.
- IES produce the market leading IESVE suite of building performance modelling tools
- Global leading <VE> software used in >130 countries
- IES' technology is supported by integrated consulting services and today its capabilities are expanding from use on individual buildings to helping create sustainable cities.
- IES Consulting wrote the Modelling Guide to support Scottish Governments Net Zero Public Buildings Standard

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- IES Consulting have worked on over 2,500 projects worldwide
- We do analysis – we don't do design

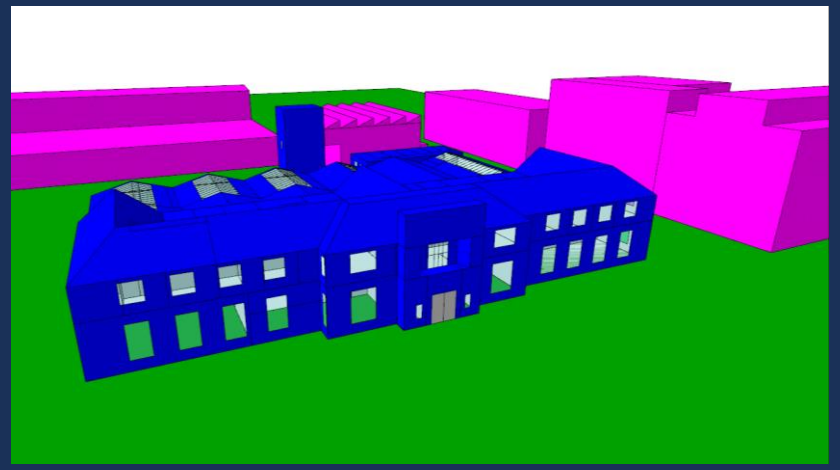
IES Consulting Services

Services include:

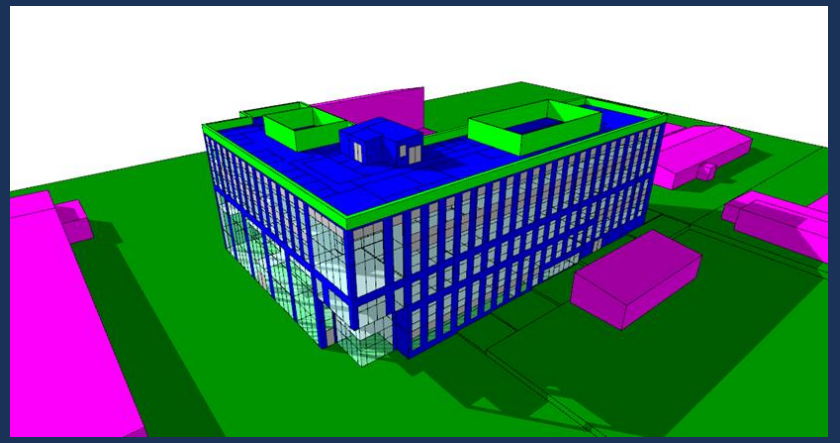
- Daylight & Solar Analysis
- Low Energy modelling
- UK Compliance Studies – Section 6, EPC's
- Comfort Studies - overheating
- Future Climate assessments
- Building Rating Systems – e.g. BREEAM
- CFD analysis –
  Internal, e.g. Data Centres,
  External Comfort and Pollutant dispersal

Buildings Studies

Sanderson Building (Existing)

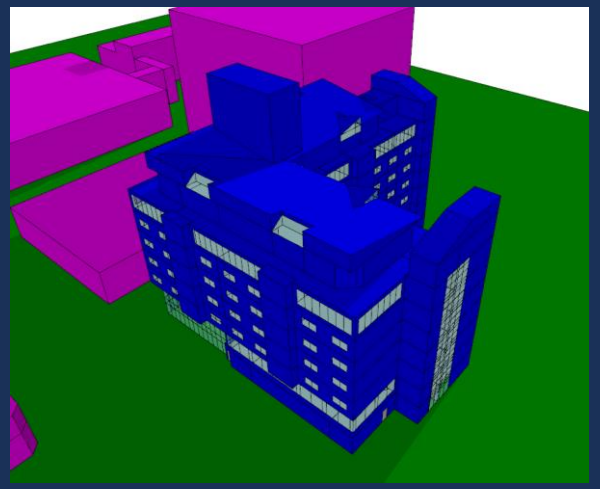


Engineering Building (New)

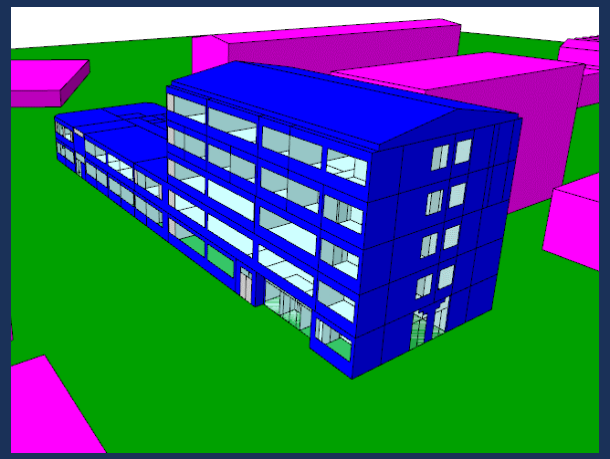


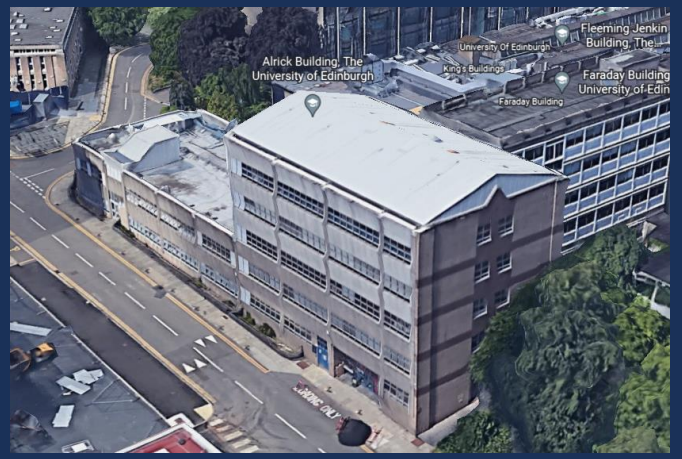
Buildings Studies

Swann Building (Existing)

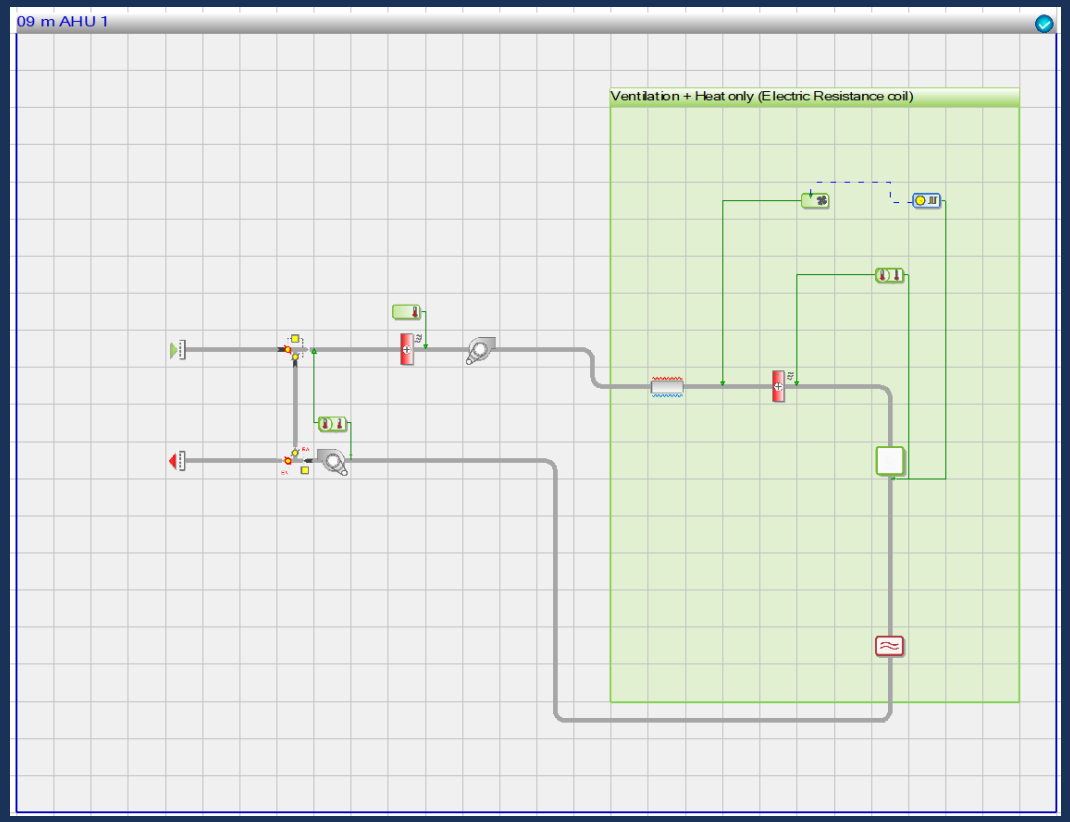


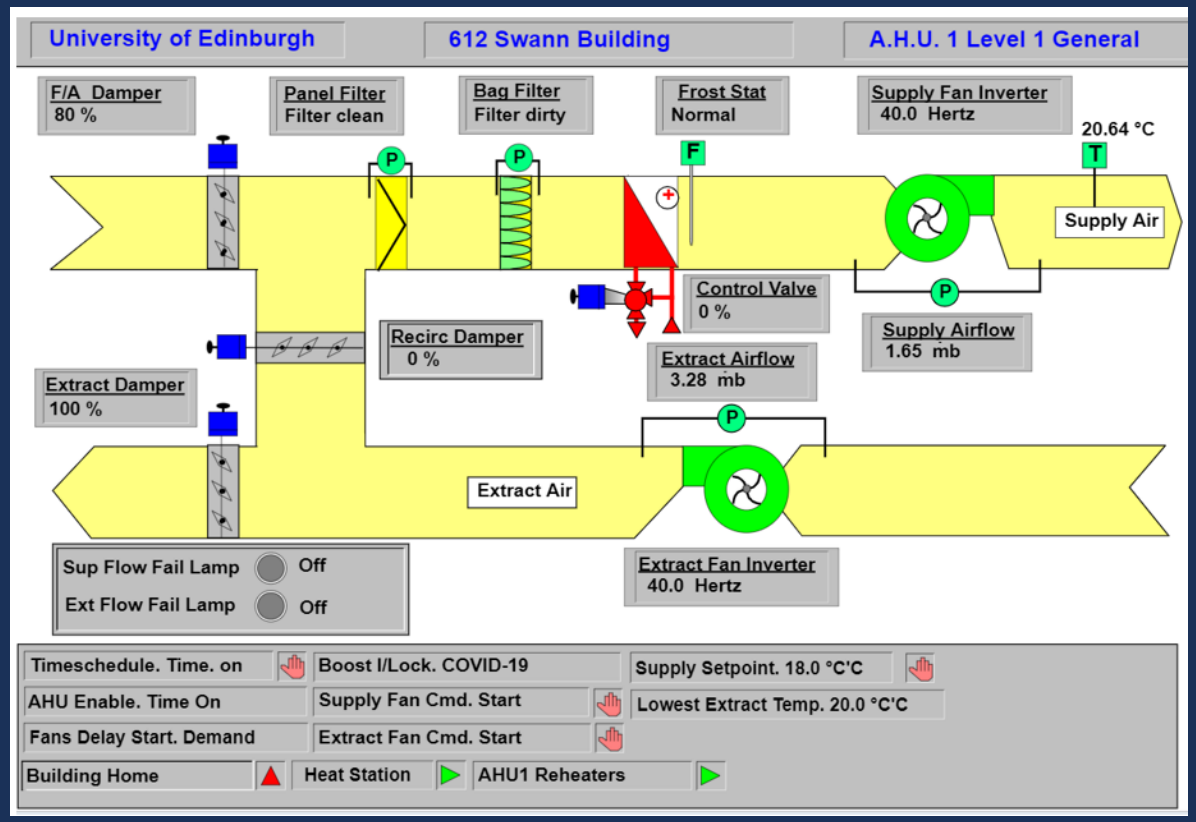
Alrick Building (Existing)





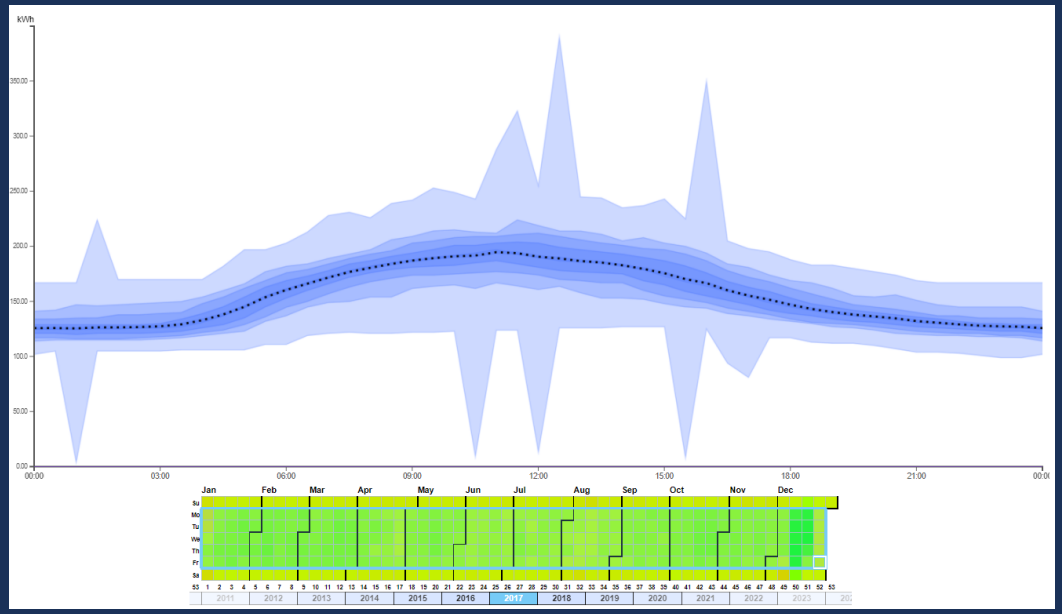
Basecase Energy Modelling
HVAC Systems

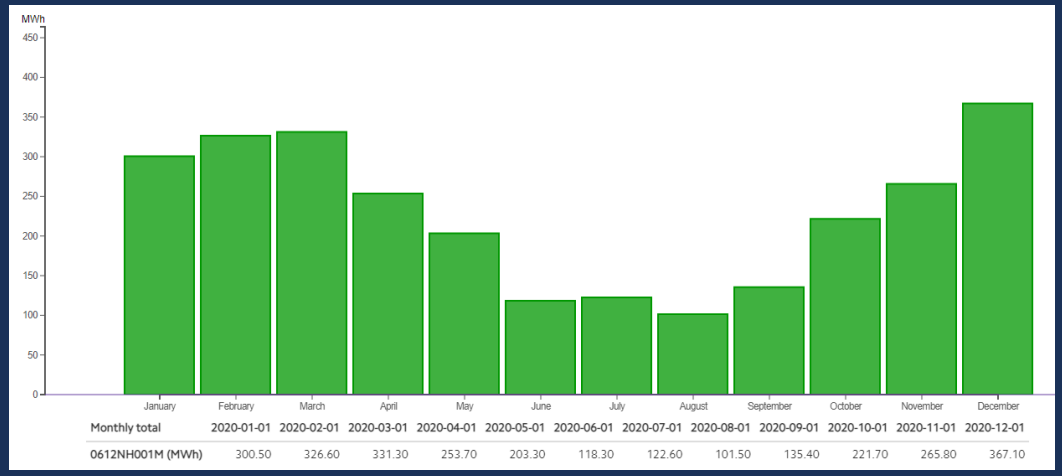




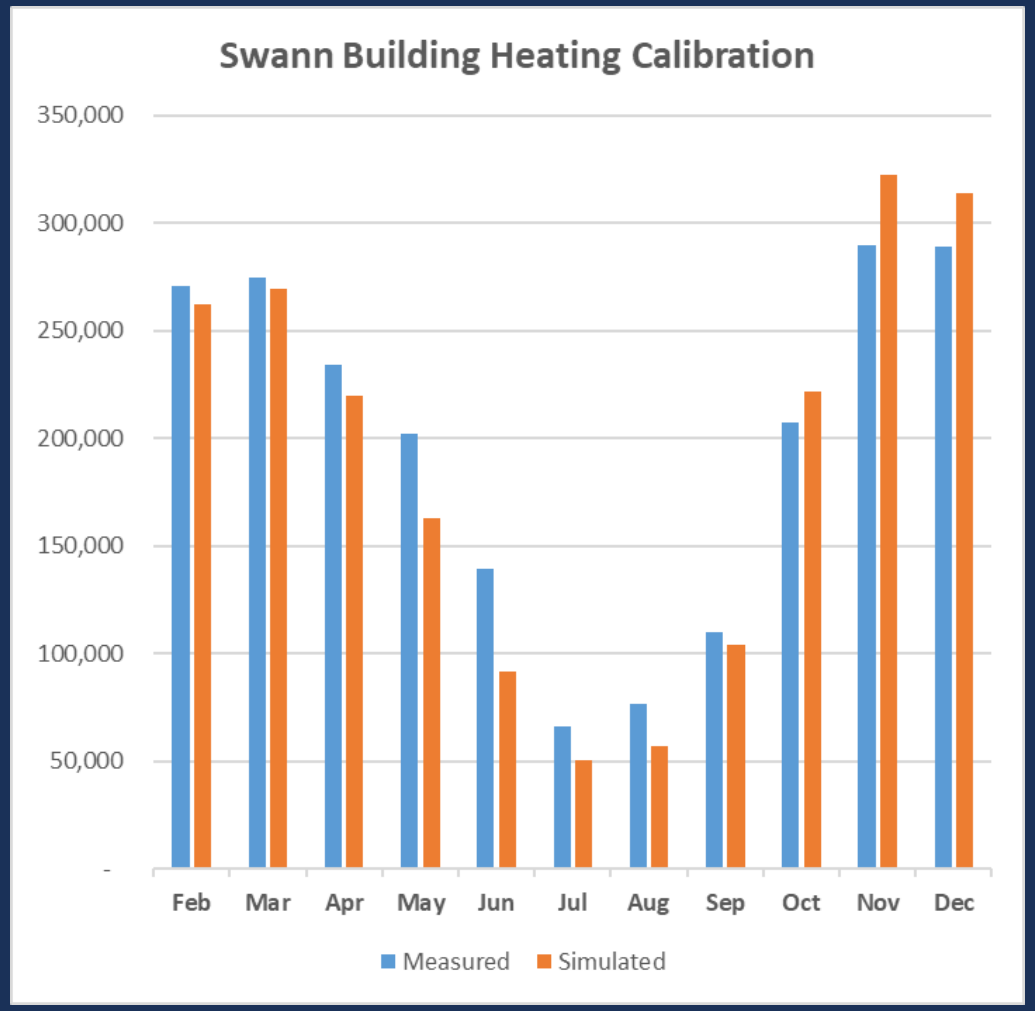
Basecase Energy Modelling Metered Data

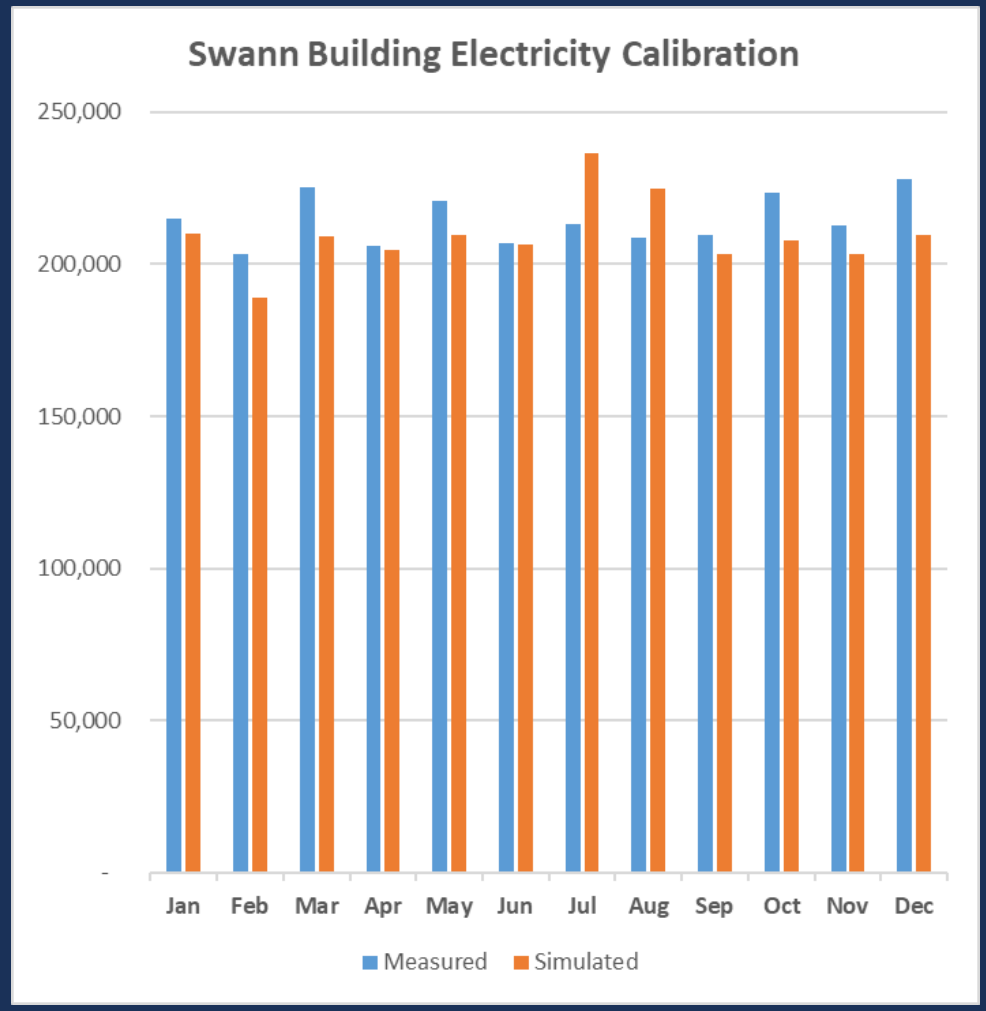
Half Hourly Metered data from electrical and heat meters provided insight into current operation and energy demands. This helped to develop a Basecase model that reflects current energy use.





Basecase Energy Modelling
Model Calibration

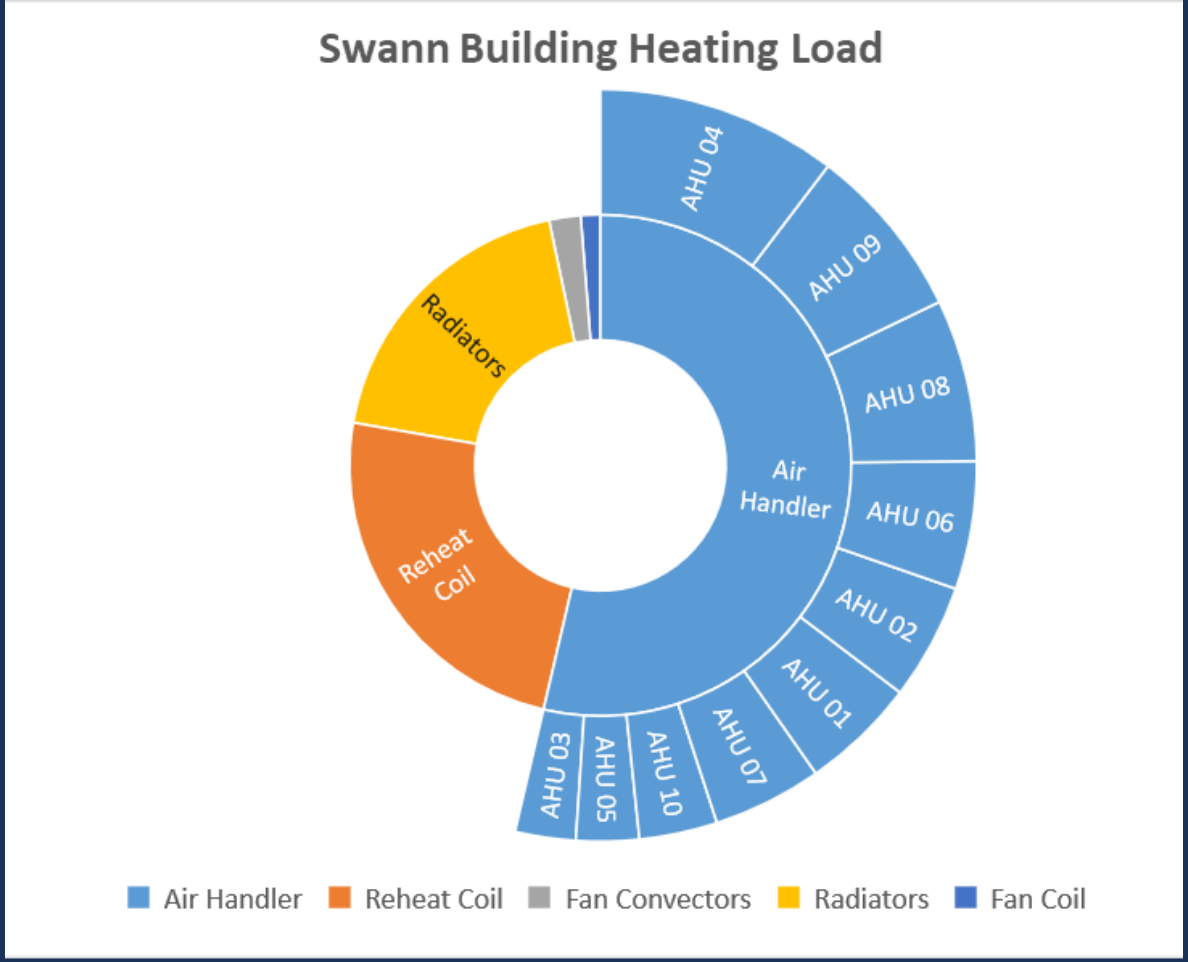




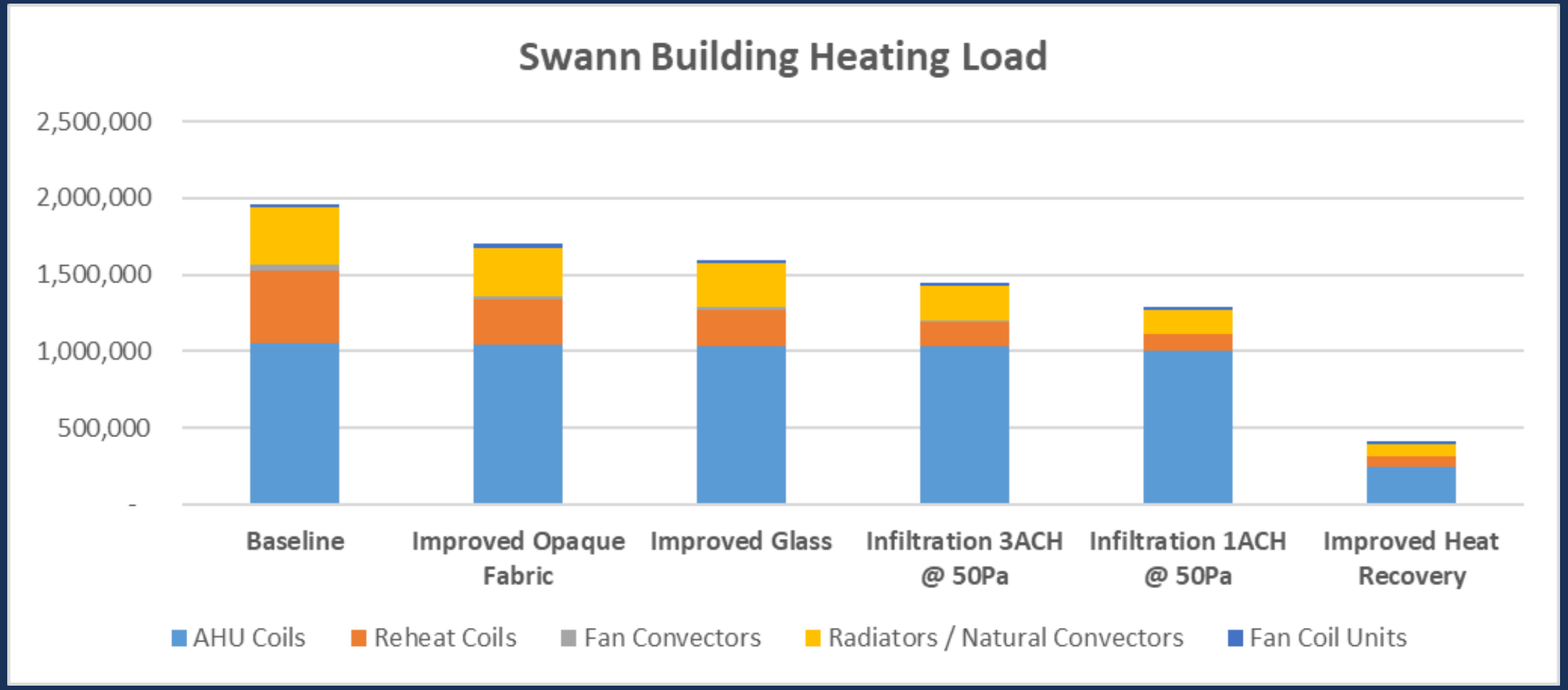
Basecase Energy Modelling Model Calibration

Analysis demonstrated a breakdown of the heating demands.

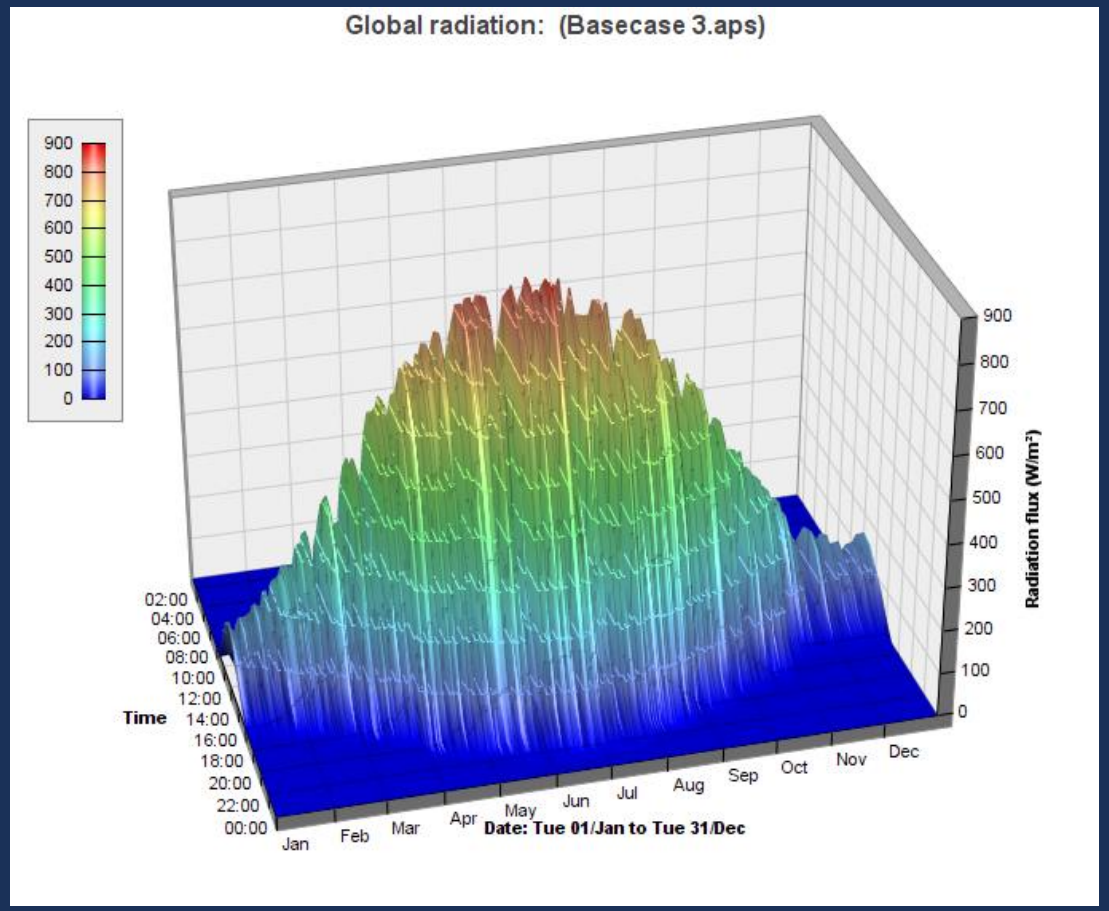
High AHU coil load due to high Airflow requirements and low efficiency of run around coil heat recovery system.

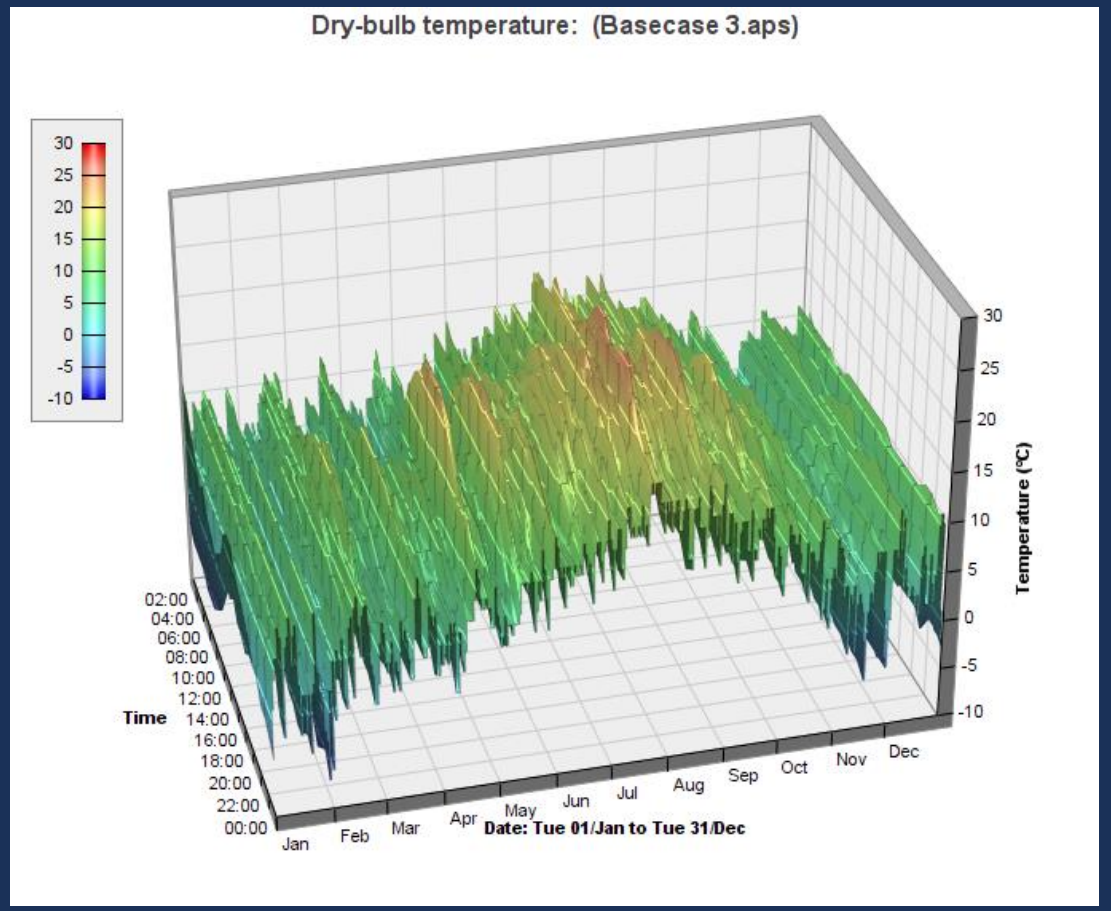


Scenario Energy Modelling
Enerphit Fabric & HVAC improvements

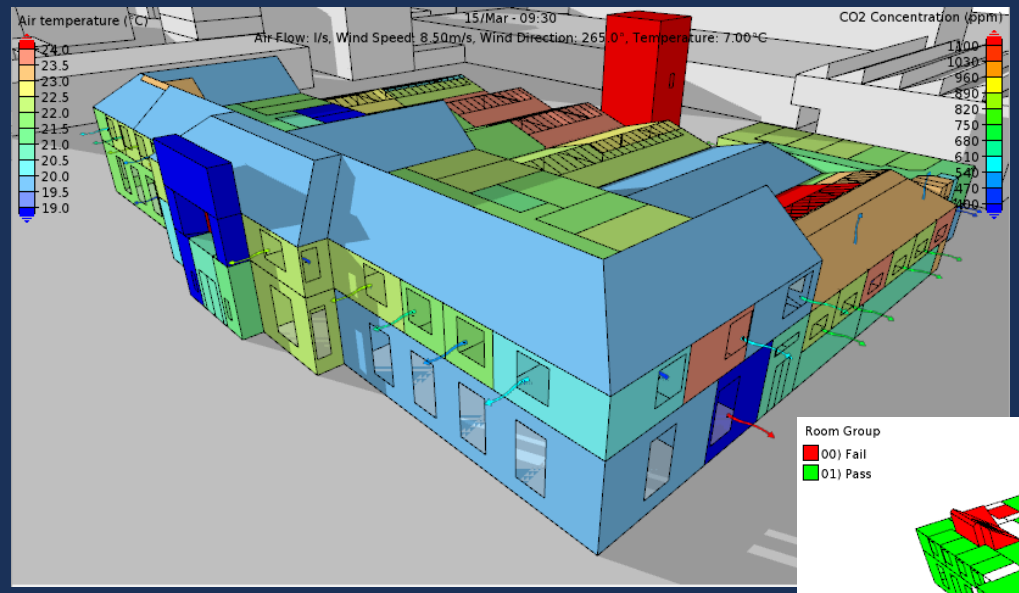


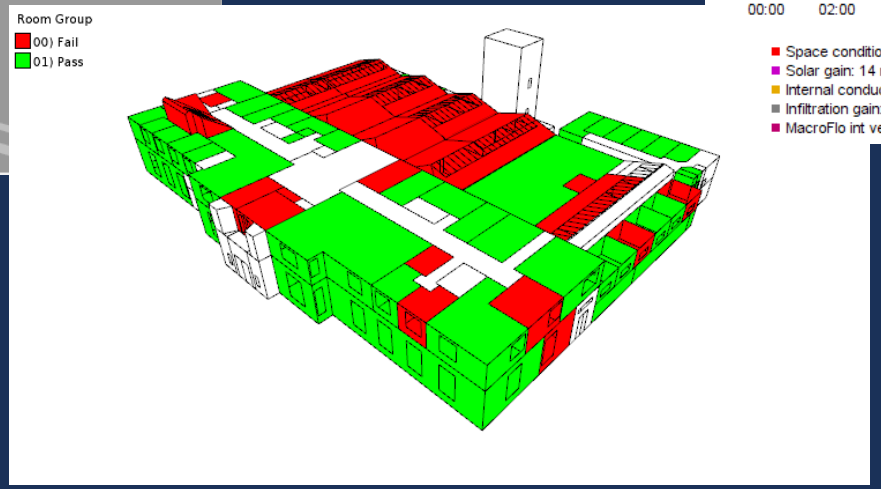
Dynamic Simulation Hourly Weather Data

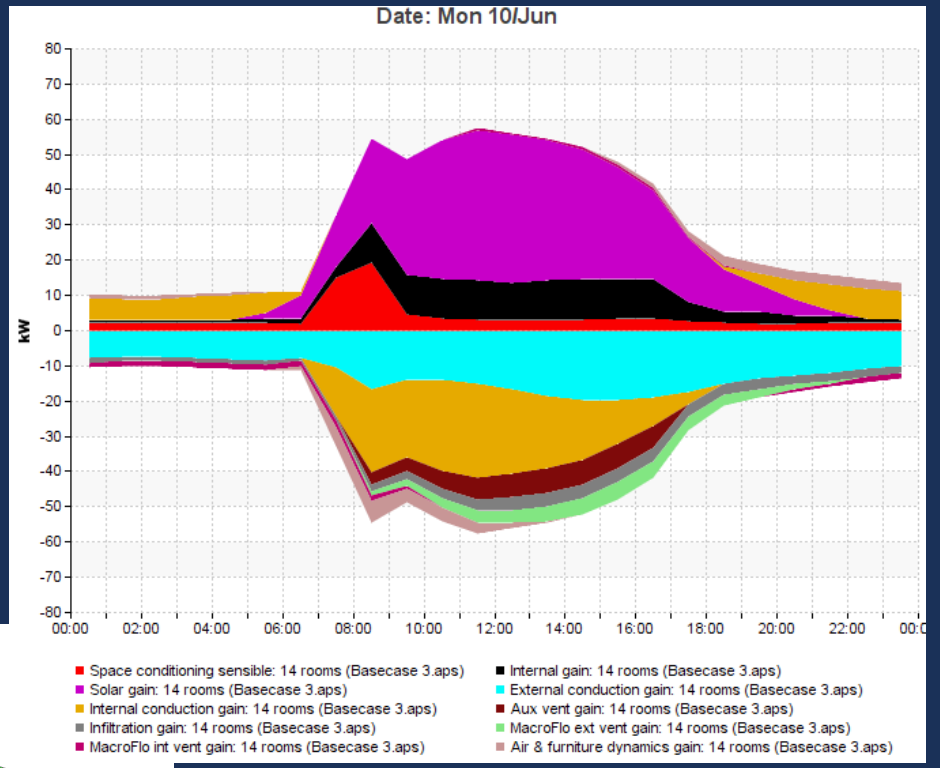




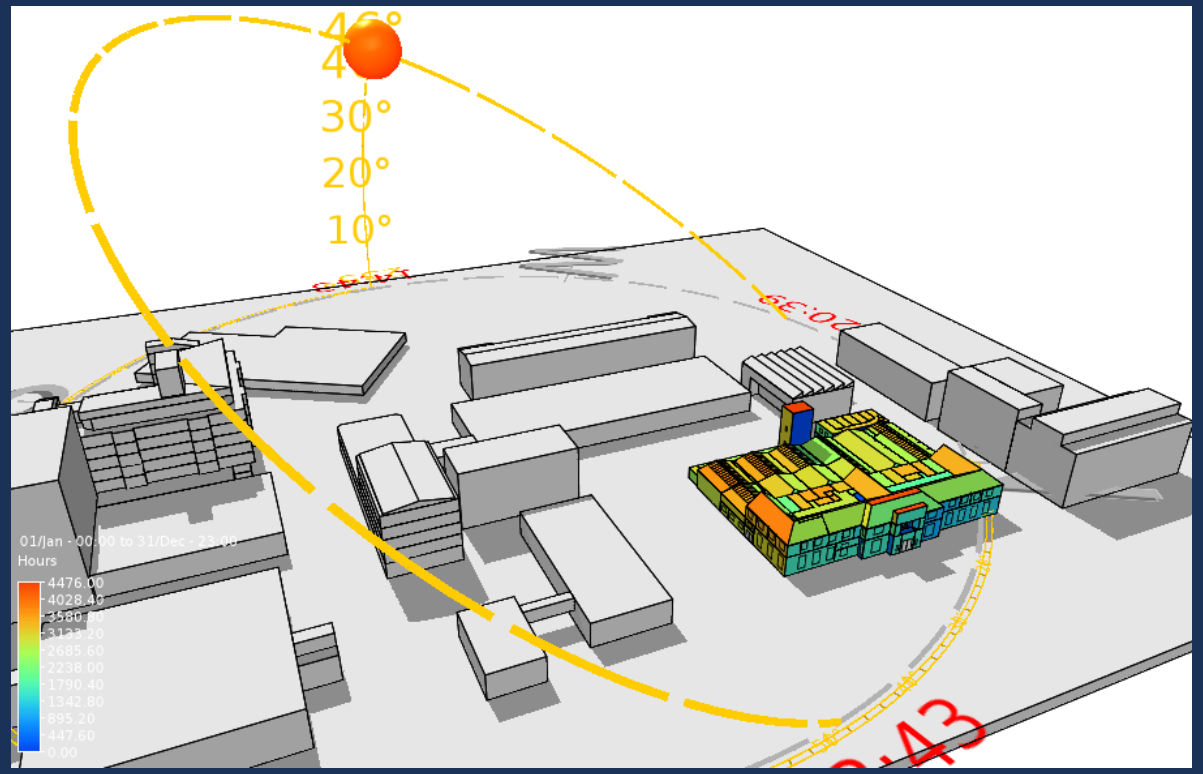
Dynamic Simulation
Thermal Comfort Analysis

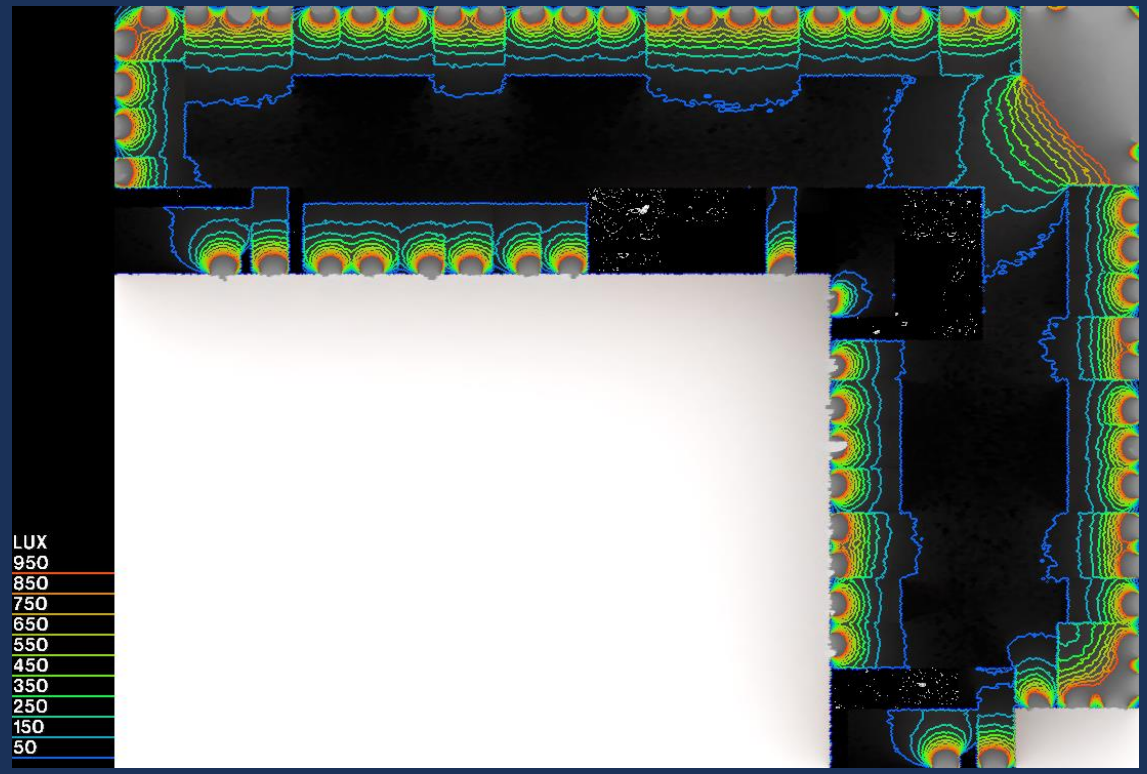






Dynamic Simulation
Solar Tracking and Daylight Analysis





Advantages of Dynamic Simulation

- Flexible analysis of real building performance rather than prescribed gains and schedules.
- Analysis of Actual HVAC system capacities and controls.
- Ability to interrogate performance of rooms and individual system. components as well as high level building energy results.
- Review results both numerically and visually.
- Ensure thermal comfort is achieved including effectiveness of natural ventilation and solar shading.
- Reduce performance gap between expected and real performance.
- Identify cost effective solutions for improving building performance.

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