

vabi

elements

**OPTIMAL HEATING AND COOLING
FOR OFFICE BUILDINGS**

www.vabisoftware.com

Optimise your buildings' comfort levels Whilst reducing energy costs and waste

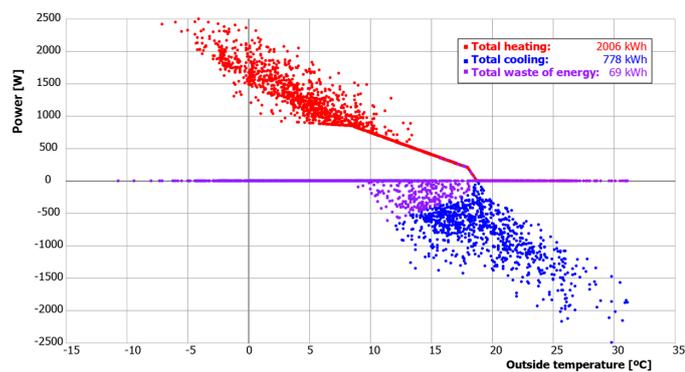
The UK Government's construction strategy is driven by the need to reduce energy consumption and eliminate wastage. Buildings contribute to more than 40% of the UK's energy consumption; with office buildings alone generating 8 Million tonnes of CO₂. Vabi's state-of-the-art dynamic simulation software, Vabi Elements, forms part of the solution. Vabi Elements enables consultants to improve the energy efficiency of office buildings by up to 25%, without compromising the indoor environment or incurring new hardware costs.

A recently released report 'Health, Wellbeing and Productivity in Offices' issued by the World Green Building Council links thermal comfort and indoor air quality to potential productivity gains of between 8 and 11% for offices. Productivity improvements can provide far higher returns than when just focusing on energy alone. By combining energy, thermal comfort and productivity you can deliver real lasting value.

The problem

Typical modern office buildings, including those which are compliant with the Energy Performance of Buildings Directive (EPBD), have costly and inefficient heating and air conditioning systems.

Thermal comfort within the modern office is determined at two levels – centrally, for the whole building and locally, at room level by the occupants. Centralised heating and air conditioning systems are typically optimised for the extremes of winter and summer. Outside of these periods thermal comfort is achieved by adjusting the temperature at room level, thus it is commonplace for buildings to be heated at a central level whilst being cooled by occupants at a room level. The reverse is also true. This results in unnecessary and wasteful energy consumption.



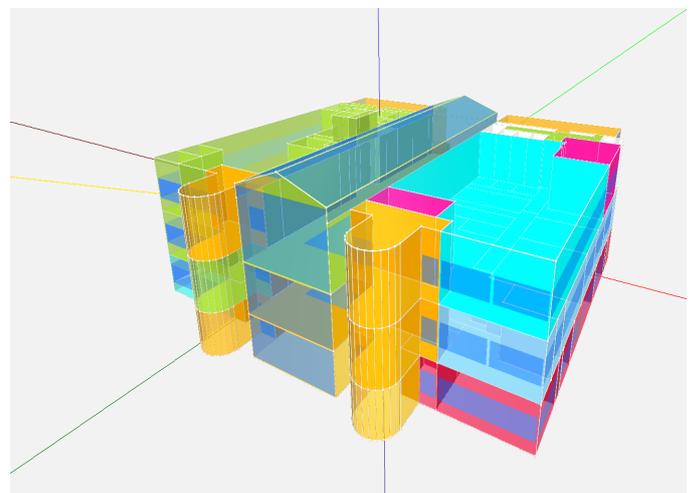
Heating and cooling as a function of ambient temperature for a room. Purple dots indicate energy wastage.

The solution

The solution is to match the central supply to the minimum demand by reducing the supply temperature in winter and raising the supply temperature in summer.

Vabi Elements software enables consultants to optimise air supply temperatures in order to prevent simultaneous heating and cooling; this typically results in 5 to 25% less energy consumption and enhanced thermal comfort. This approach does not require additional investment in hardware and can be applied to both new and existing buildings.

Heating and cooling demand as a function of the environmental temperature is central to the methodology. For new buildings in design or under construction, this can be assessed using dynamic simulation calculations. For existing buildings, the current settings from the building energy management systems (BEMS) are assessed in a simulated building model. The methodology determines at which outside temperatures the air supply temperatures can be lowered in order to prevent simultaneous heating and cooling.



How we can help you

Our technology and training will enable you to analyse buildings in a way that has the potential to bring significant cost and energy savings to your clients

Our Vabi Elements technology facilitates the delivery of the following two-day consultation offering to your customers.

1. Project assessment and data collection

Collect all the necessary data (building properties and design data) for the project.

2. Building Performance Modelling

The next step is to create a building model and analyse the information within the Vabi Elements software to determine the heating and cooling demand of the building as a function of the outside air temperature. This analysis will determine the shape of the 'new' heating/cooling curve.

Other aspects of the HVAC system (AHU, fans, heat recovery) will be fed into the building model to assess their impact in the heating/cooling curve. This will be undertaken as an iterative process along with other preconditions or constraints such as draught, humidity, condensation, to provide a final recommended heating/cooling curve.

Business Benefits - Office Buildings

- Reduce energy consumption by up to 25%
- No new HVAC equipment required
- Applicable to new and existing buildings
- Quick to implement
- Short payback period
- Optimise thermal comfort and productivity, whilst minimising operational costs

**significant cost and efficiency gains
can be accrued within the first 12 months**

3. Optimally performing heating and cooling system

A final report will be produced detailing the optimal heating and cooling curve, the anticipated energy savings and forecasted improvement in thermal comfort. The calculations will be based on the actual occupation patterns of the building.

This low cost approach can result in rapid payback through the resulting cost and efficiency gains.

Vabi Elements ensures your building best meets the needs of your clients; optimising thermal comfort whilst minimising operational costs and complaints.



About Vabi

Established in 1972, Vabi is the market leader in the Netherlands for building performance modelling software. Vabi was founded as part of the Dutch Government's Research Institution, (TNO) serving as the Centre of Expertise on Building Service Calculations.

Our continually expanding customer base exceeds 2000 clients in the engineering and building owners markets; from international blue-chip organisations to small practices.

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