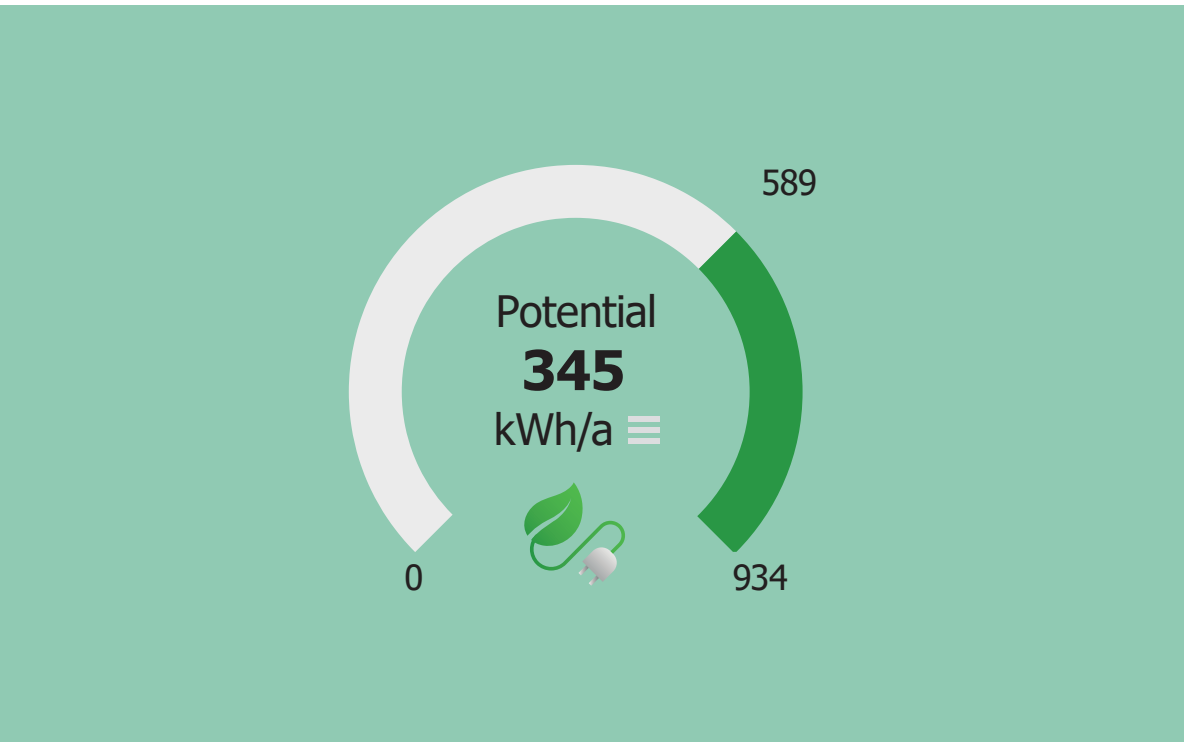


Saving energy is easy with DIALux evo

Evaluate and document the energy consumption in your lighting design project.

DIALux

DIALux evo gives you the best possible support in your design process. Since version 11.0, you have many important functions relating to energy evaluation. Get information on the energy demand and the savings potential of a lighting system with daylight control.

The purpose of this description is to give you a structured overview of the new functions. We explain the interrelationships in a compact way and provide information on how to use the software.

We show you two types of energy assessment.

Index

Saving energy is easy with DIALux evo

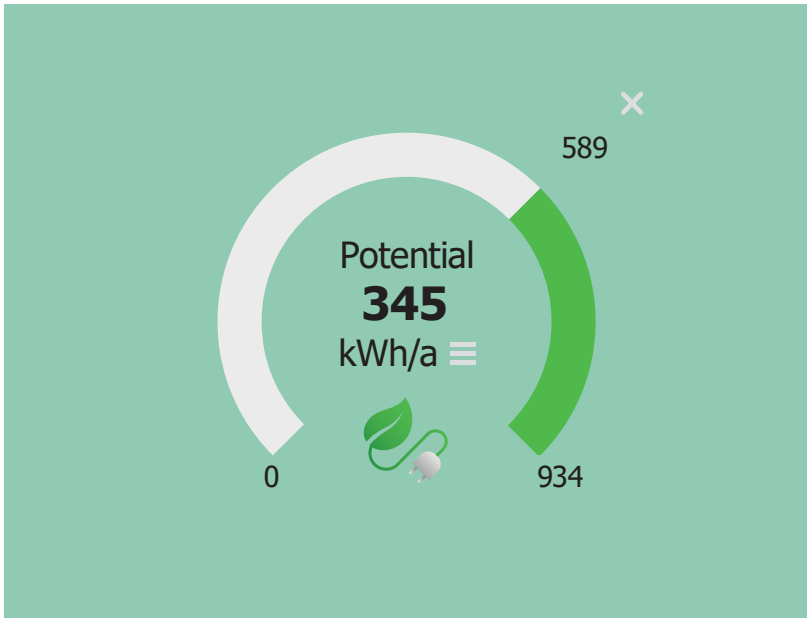
DIALux

The energy tachometer

When luminaires are included, the tachometer automatically appears in the CAD window, providing information on annual consumption and potential savings through the use of a daylight-dependent control system.

The tachometer can be hidden with the x in the top right corner.

The display option can be changed via the three dashes.

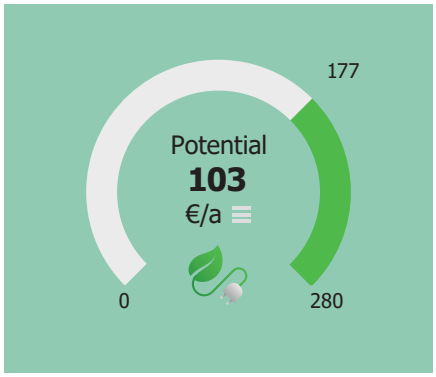


Maximum energy saving

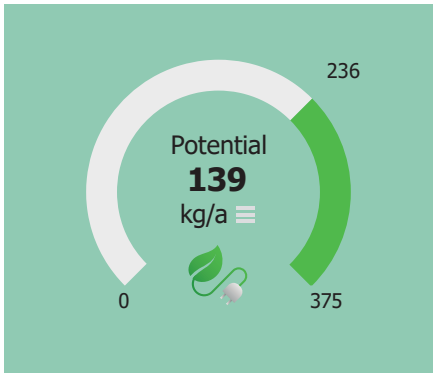
Display options

The default setting shows you the Maximum energy saving (kWh/a). Further views are available: LENI (kWh/(m2 * a)), Costs (€/a) and CO^2 (kg/a).

LENI



Costs



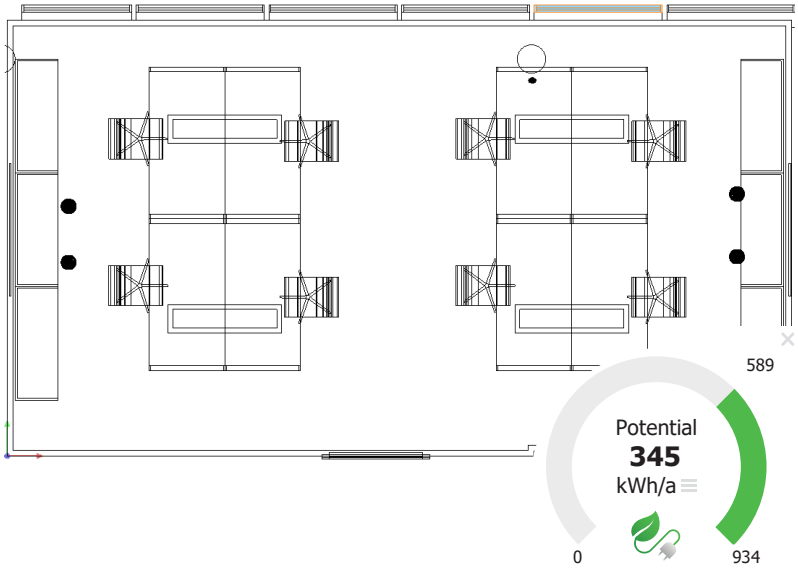
CO^2

DIALux

Energy evaluation according to standard

The first type of energy evaluation is according to the standard. The values are based on **EN 15193**: Energy performance of buildings – Energy requirements for lighting. According to the standard, this is a general estimate, intended to give a first overview of the savings potential.

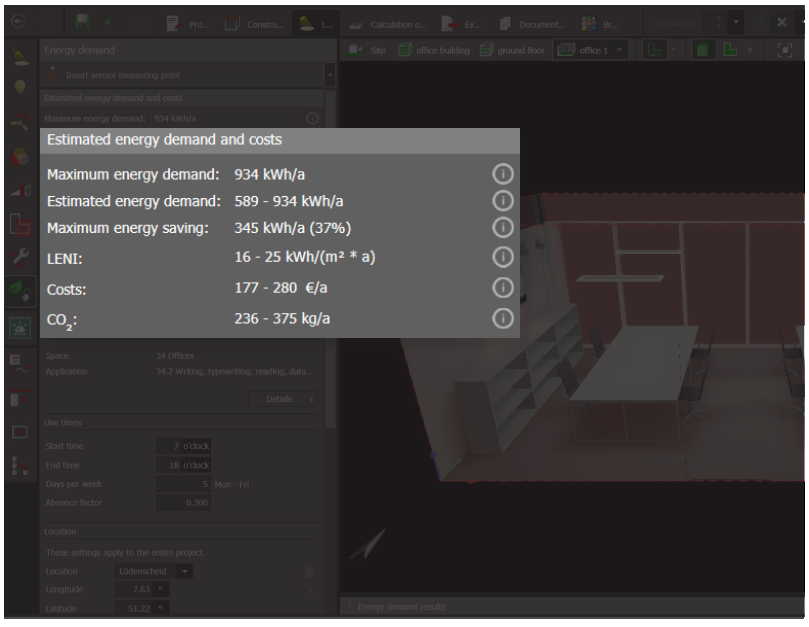
As you can see on the previous page, the energy tachometer appears automatically as soon as luminaires are included in your project. Remember, you can close the tachometer with the ✕ and change the display option with the three dashes ☰.



Energy Evaluation Tool

In addition to the tachometer, you will be able to see your detailed results in the Energy Evaluation Tool. According to the standard, you can see the **Maximum** and the **Estimated energy demand**. The difference between these two values is your saving potential, called **Maximum energy saving**.

The CAD view (storey or room) determines the display of the values.



Energy evaluation calculated exactly

The second type of energy evaluation is not only based on the general data of the standard, but also on an **hourly calculation procedure for a whole year**. DIALux evo requires further information and takes into account the following influencing factors for the entire 8,760 hours:

Daylight condition
- Location of the building (site)
- North alignment
- Building (consideration of shading; the possible reflection of a building is not taken into account)
- Windows/Rooflights/Systems

Room geometry/Interior design
- Dividing walls
- Furnishing
- Colour/Materials

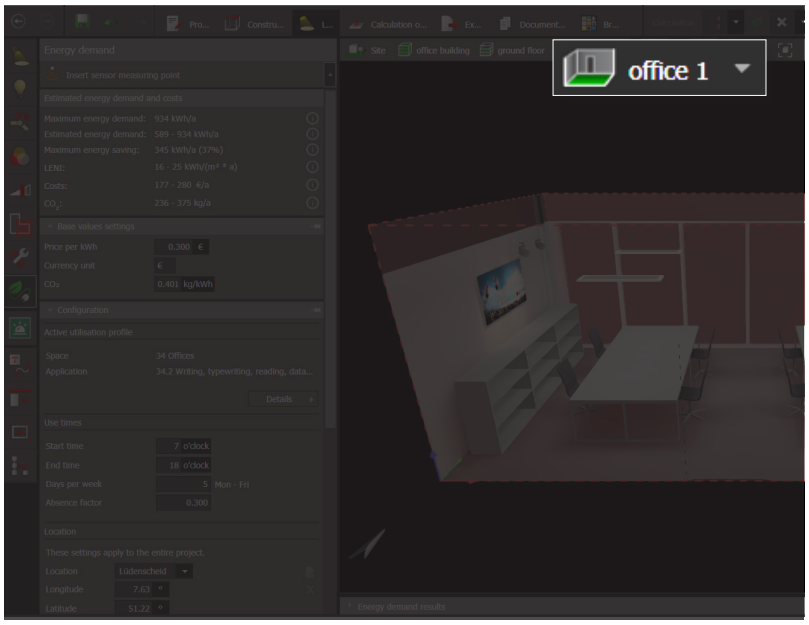
Type of utilisation
- Duration of use (operating hours day/night, working days per week)
- Required lighting level

Type of Lighting
- Luminaires (system power and luminaire luminous flux)
- Control/Regulation

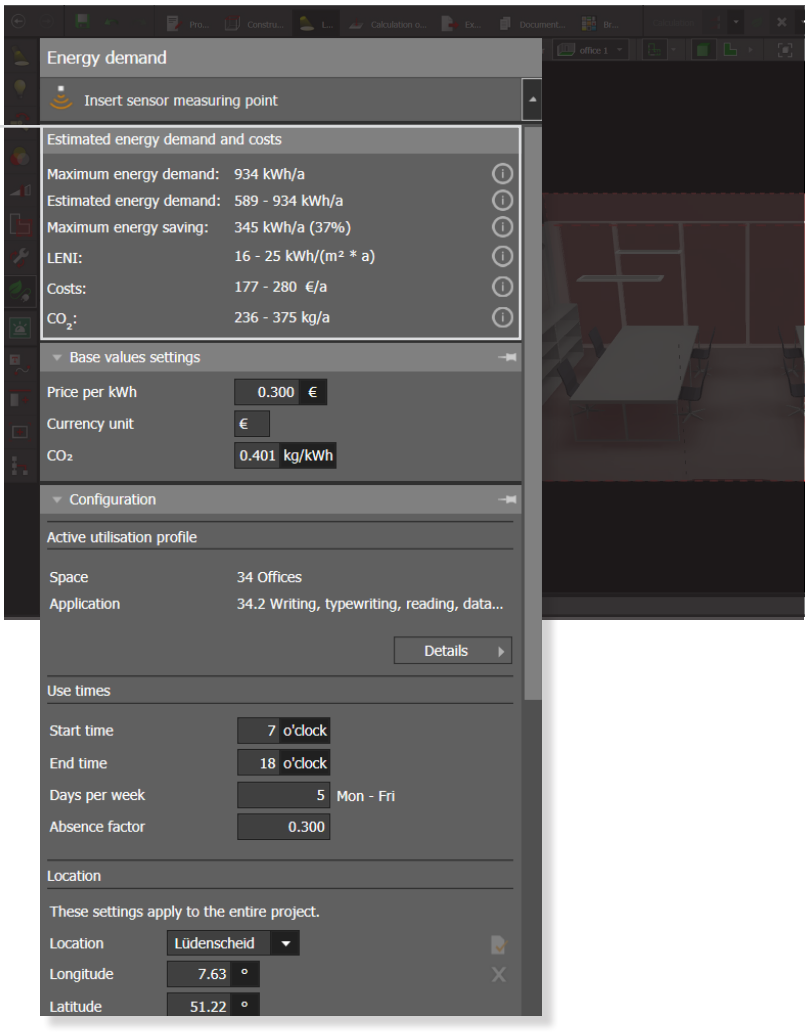
The fact that the exact energy evaluation is based on an hourly model means that it can be compared with other trades based on the same model, such as heating, air conditioning/cooling or ventilation.

Our example project: The office

All energy evaluation functionalities are available in the **room view**.

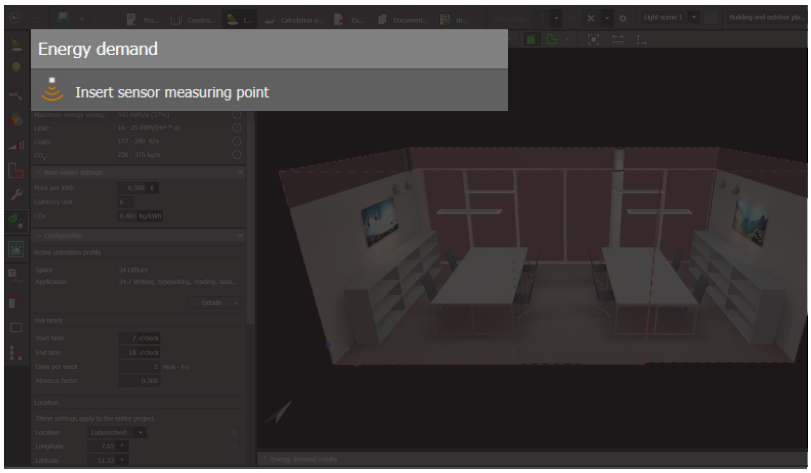


Left column allows quick checking and manual adjustment of important parameters.

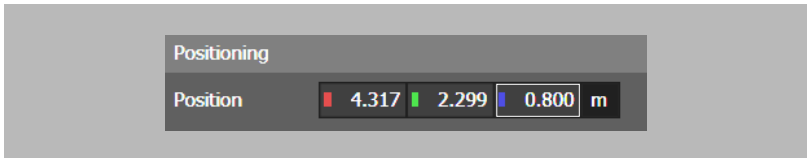


Please note! This is the energy evaluation according to standard (page 3). These values will disappear once you have entered all the information for the exact calculation.

Step 1
The **sensor measuring point** is inserted first. The measured illuminance, which is generated exclusively via the artificial lighting at this point, is used as a reference value. DIALux evo checks this reference value in relation to daylight. If the illuminance can also be achieved via daylight, the artificial lighting can be dimmed or perhaps even switched off completely.



As default, the sensor measuring point is automatically positioned in the **centre of the room** (Fig. 1) and at the **height of the working plane** (Fig. 2, 0.800 m in our example).



The position can be changed if necessary. This is recommended if, for example, the sensor measuring point is too close to a piece of furniture and is shaded. Or if the point is positioned directly under a luminaire so that a particularly high point illuminance is achieved there with only one luminaire.

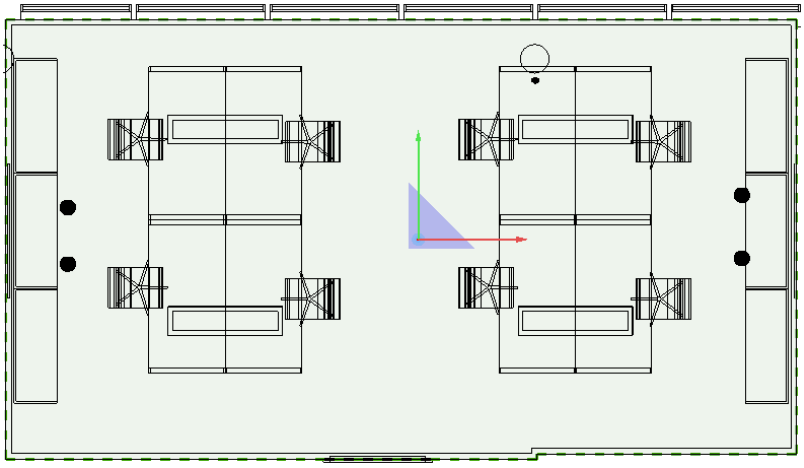


Fig. 1: Groundfloor

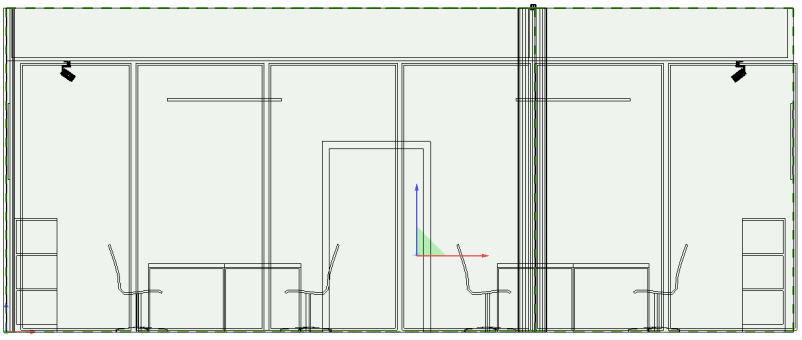
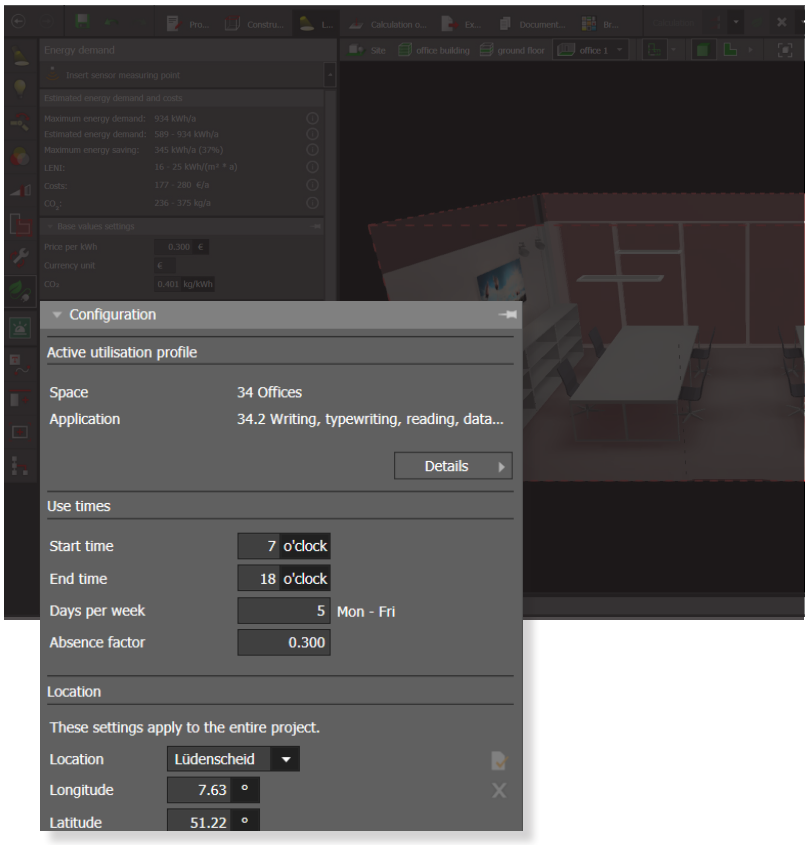
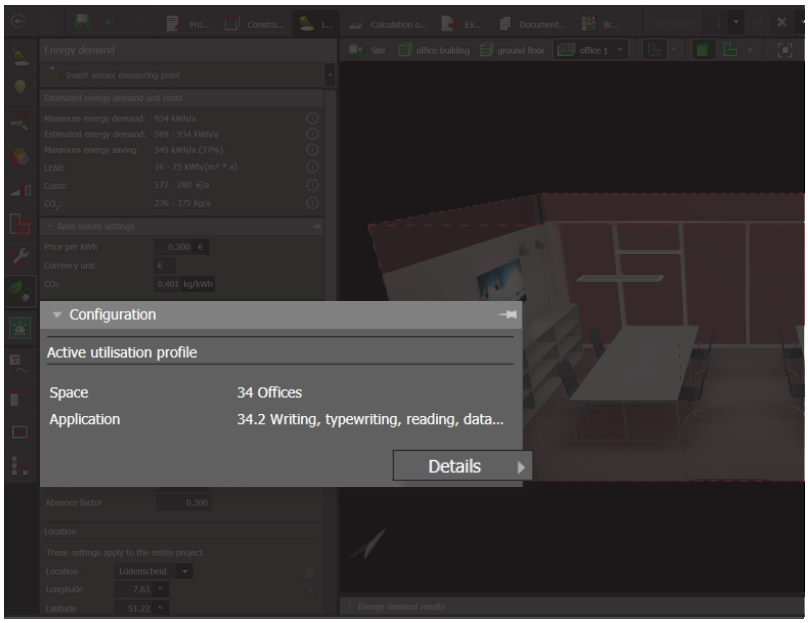


Fig. 2: Frontview

Step 2
In the **configuration**, you can not only make important inputs, but also make changes to the existing parameters. All contents are explained below.



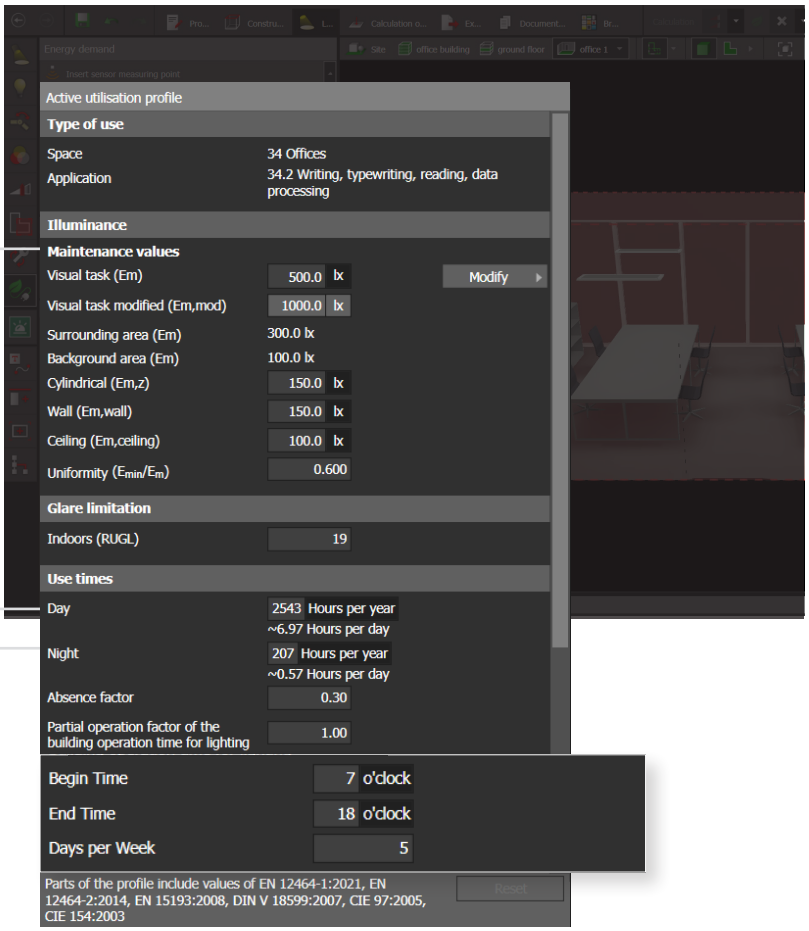
If the **active utilisation profile** is not yet correct, the corresponding profile can be selected directly under **Details**.



The **utilisation profiles** contain a lot of detailed information and are based on different documents, which you can see at the end of the column.

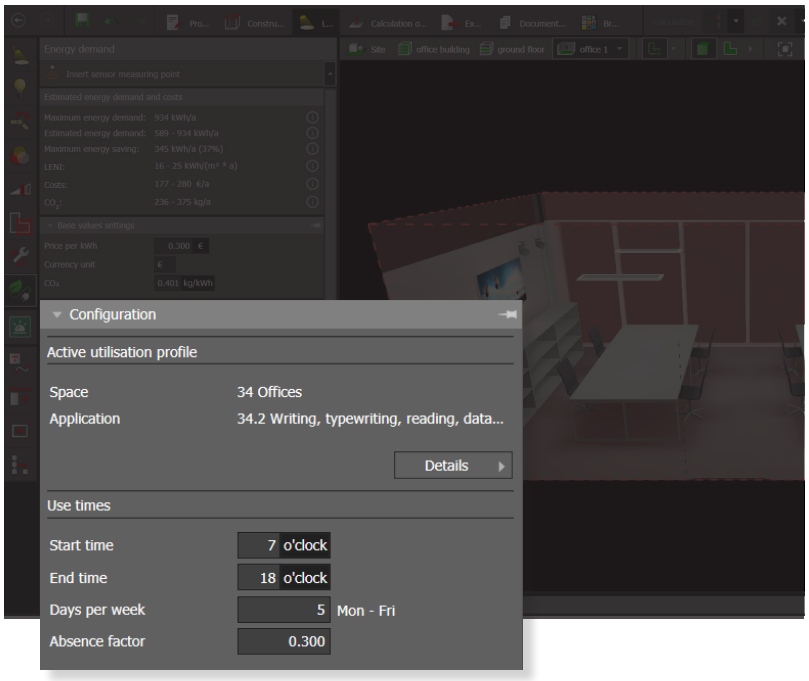
EN 12464: Light and lighting – Lighting and work places

DIN V 18599: Energy efficiency of buildings
These operating hours (hours for day and night per year) are "general times" of the standard.



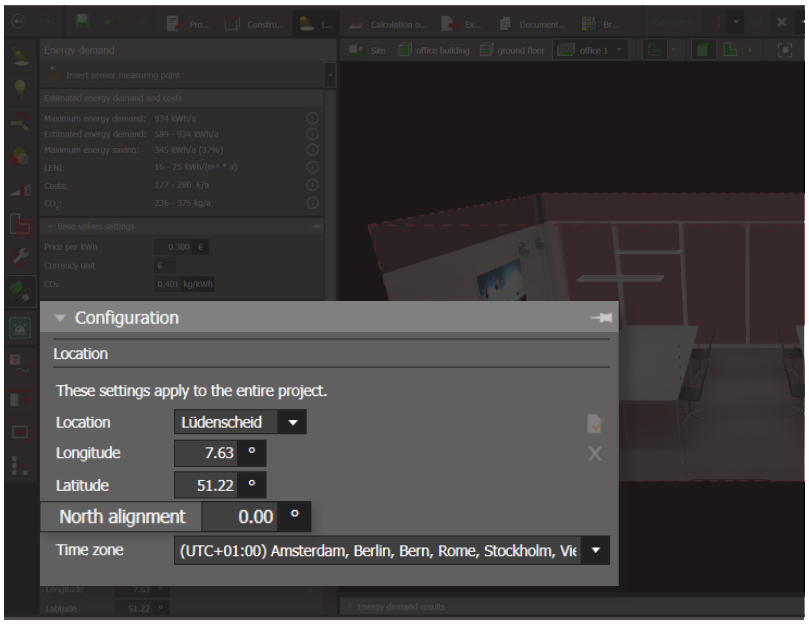
If you know the **Begin Time** and **End Time**, as well as the number of working **Days per Week**, and these deviate from the standard values, you can enter the correct data here for an even more precise calculation.

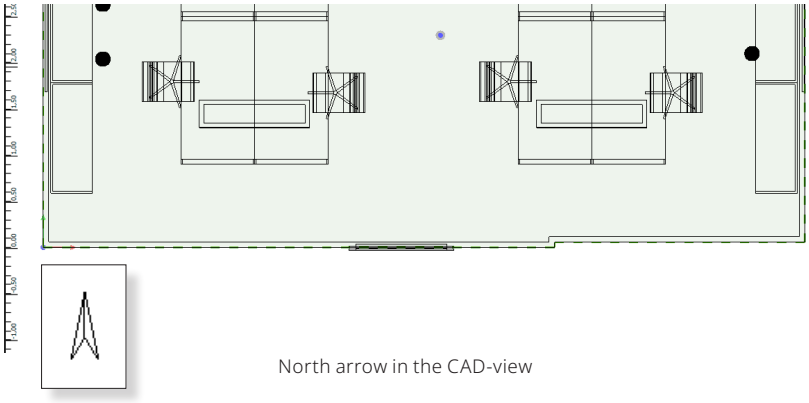
The fields for entering **Use times** are also also visible outside the utilisation profile directly in the configuration column.



The **Location** section is also part of the configuration. Here you can enter information about the orientation of the building.

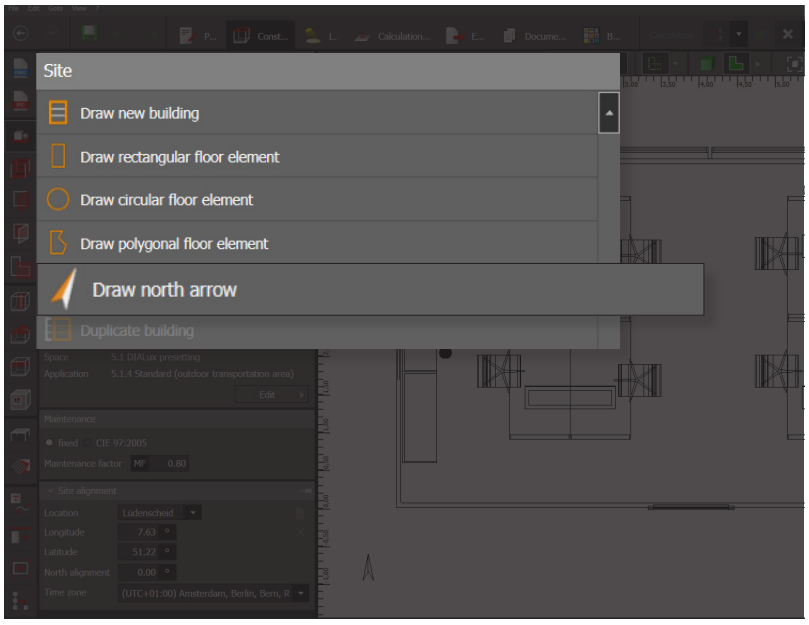
By default, the **North alignment** is 0.00°. This means the north arrow points upwards in the CAD window.





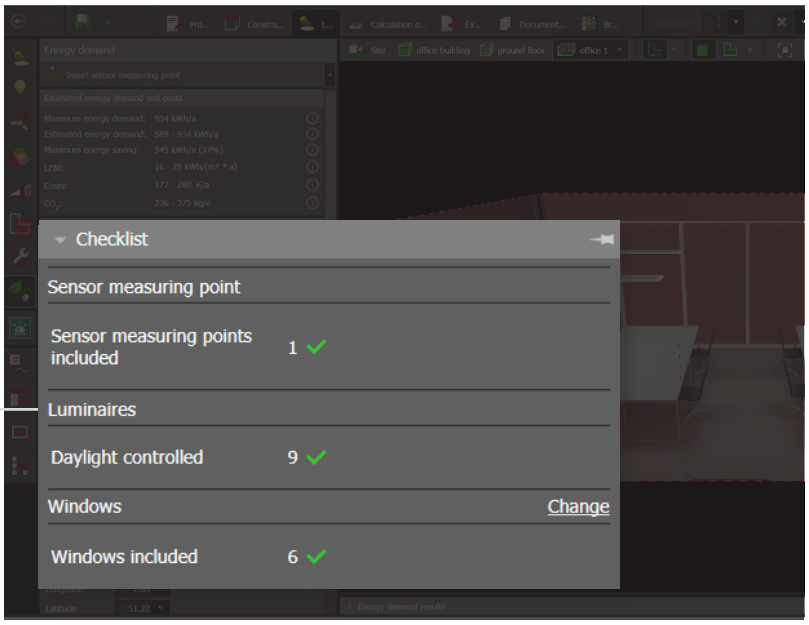
North arrow in the CAD-view

If the angle of the north alignment is not known, the north arrow can also be drawn. The function **Draw north arrow** is in the mode **Construction** and the tool **Site**.



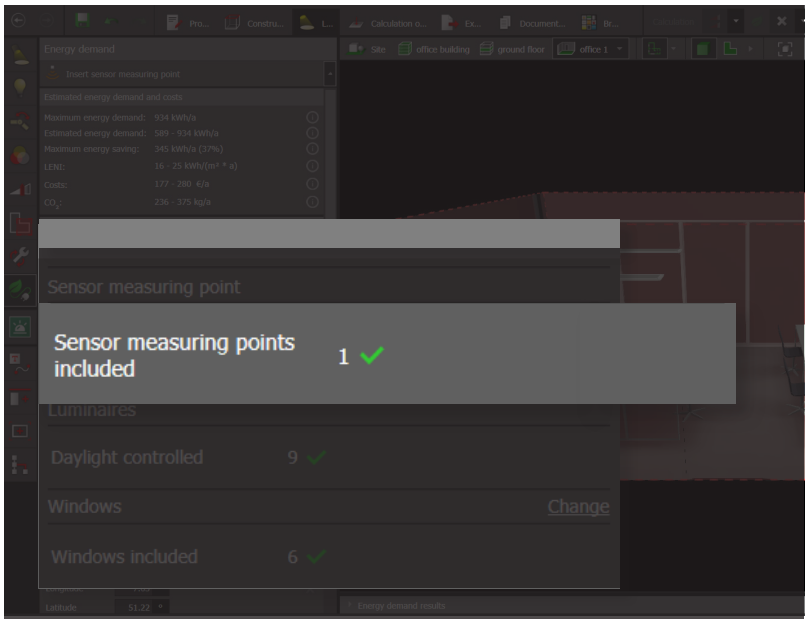
Step 3
The **checklist** includes important parameters for the energy evaluation.
For the most accurate evaluation, you should check everything and change it if necessary.

Please note! Each luminaire is automatically assigned a daylight-dependent control. DIALux evo does not check whether a luminaire fulfils the dimming function or not. You are responsible for precise product-specific inputs here. The more precise the inputs, the more accurate the following evaluation of the energy demand and the savings potential.

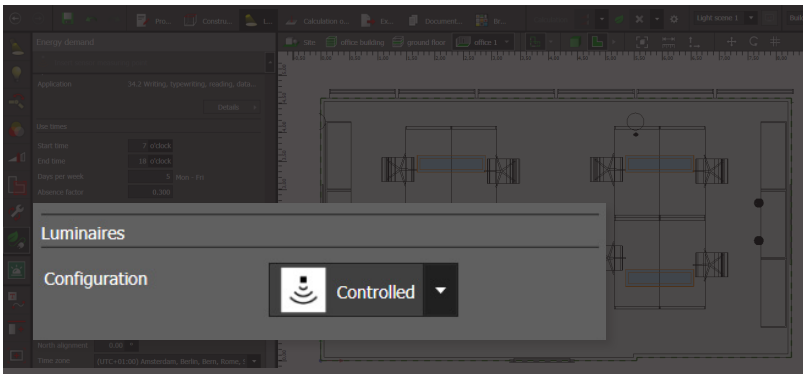


Default setting after inserting the sensor measuring point

As you can see the **sensor measuring point** from step 1 is included in the room.



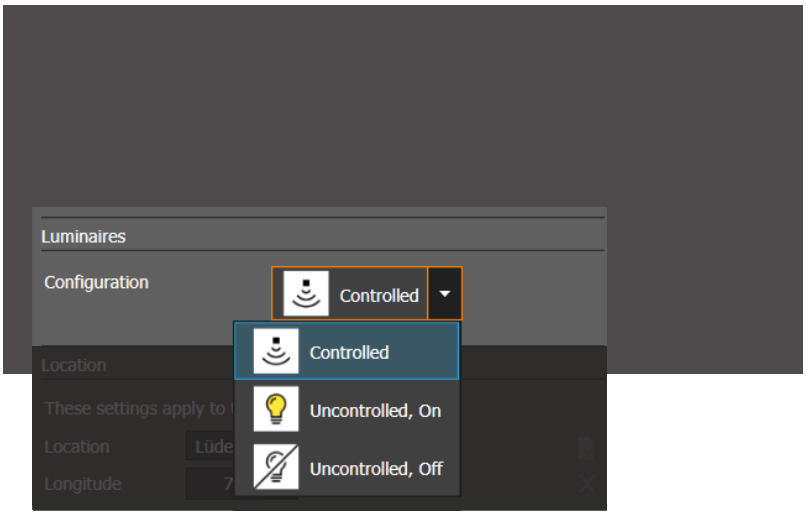
You can set **manual changes** for each **luminaire**. The selection field in the left column appears as soon as luminaires are selected in the CAD window.



Selection field for control after marking the luminaires in the CAD view

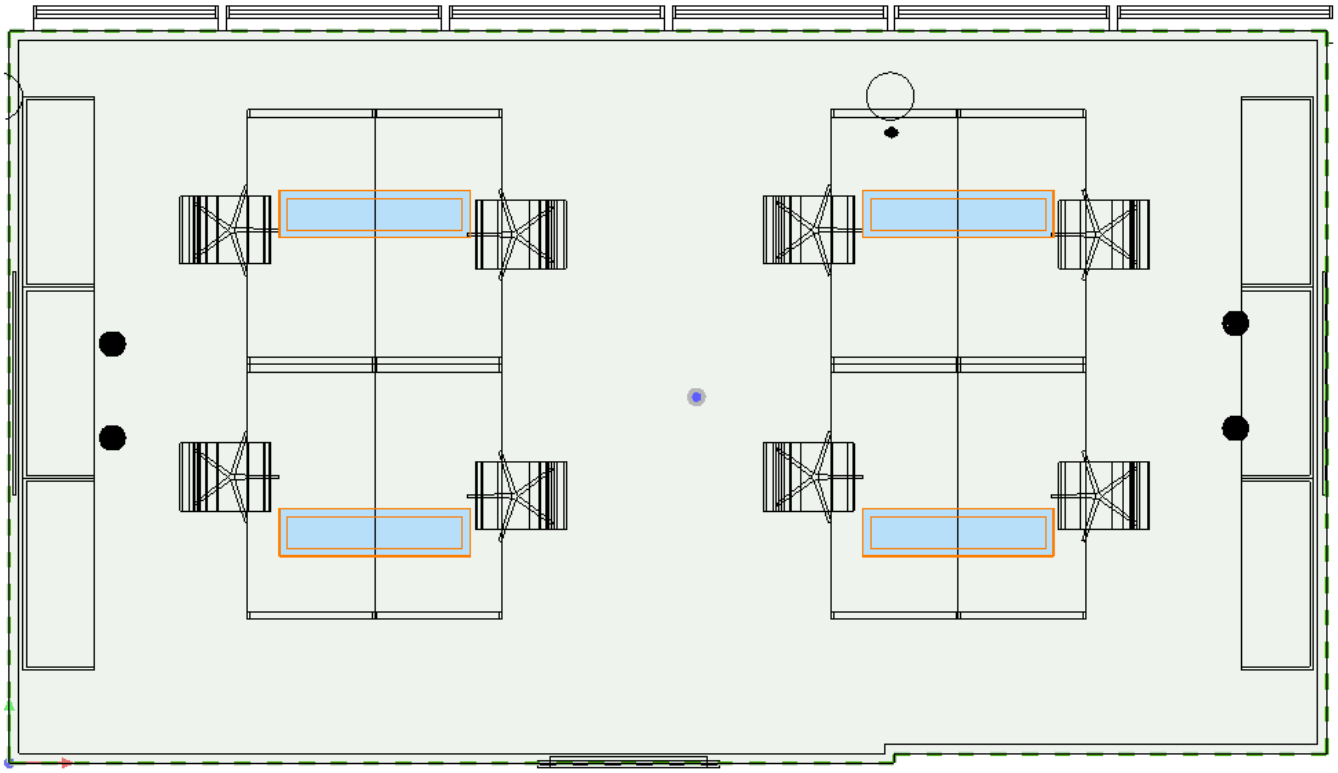
There are three **settings** for **marked luminaires**:

- **Controlled** *
  Without constant light control
- **Uncontrolled, On**
  Energy demand is taken into account
- **Uncontrolled, Off**
  No influence of energy demand

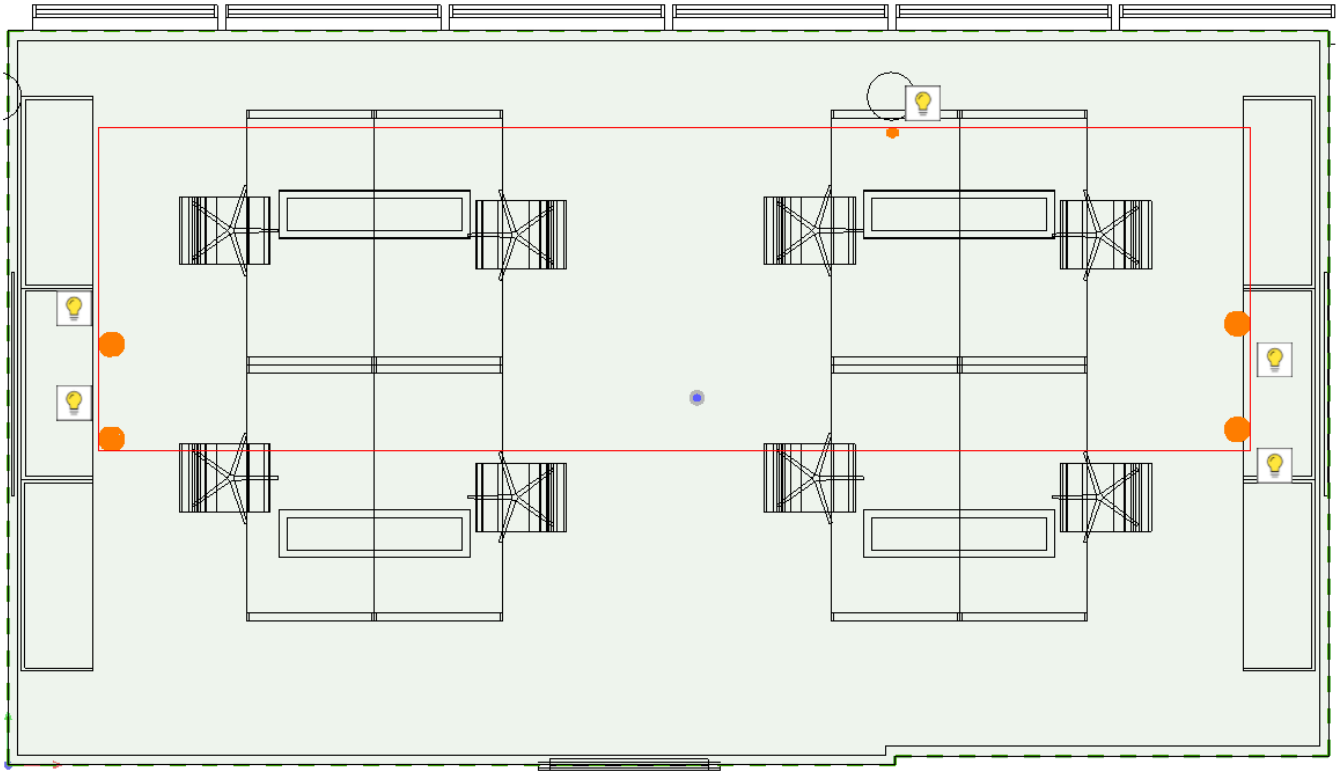


* For daylight-dependent controlled luminaires, DIALux assumes a linear relationship between system power and luminaire luminous flux in the dimmed state.

See next page for our example.



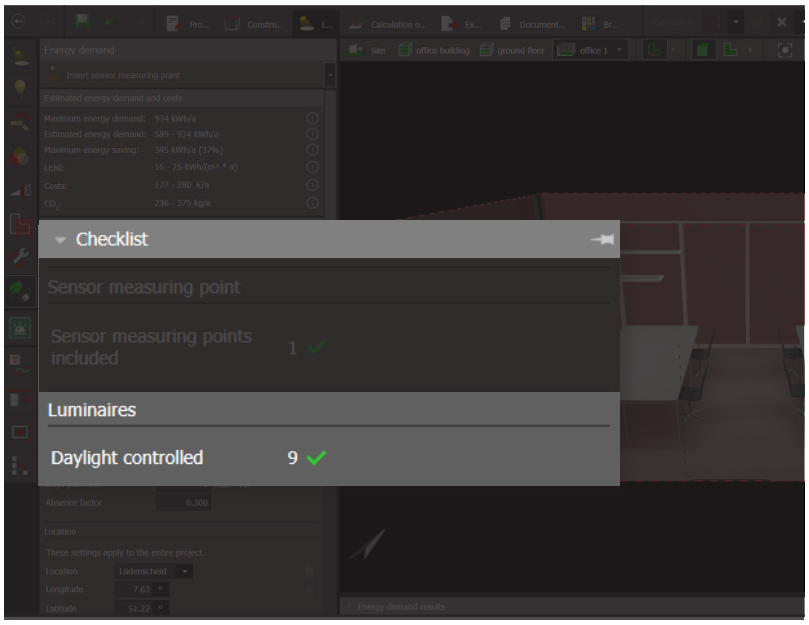
Four pendent luminaires: **Controlled**



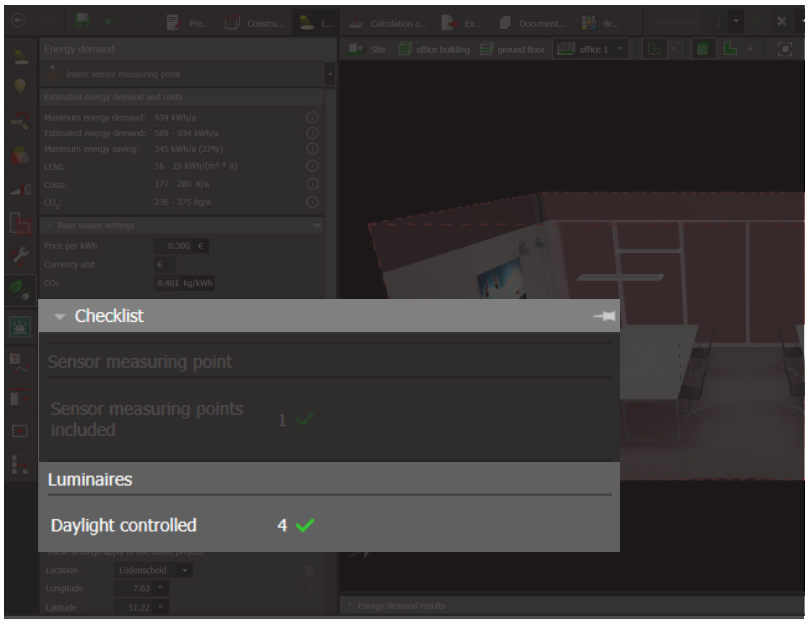
Five spots: **Uncontrolled, On**

From our 9 luminaires we changed 5 spots to **Uncontrolled, on**. 4 pendent luminaires remain in the automatic setting **Controlled.**

The checklist shows the changes:
The **Daylight controlled** luminaires changed from 9 to 4.



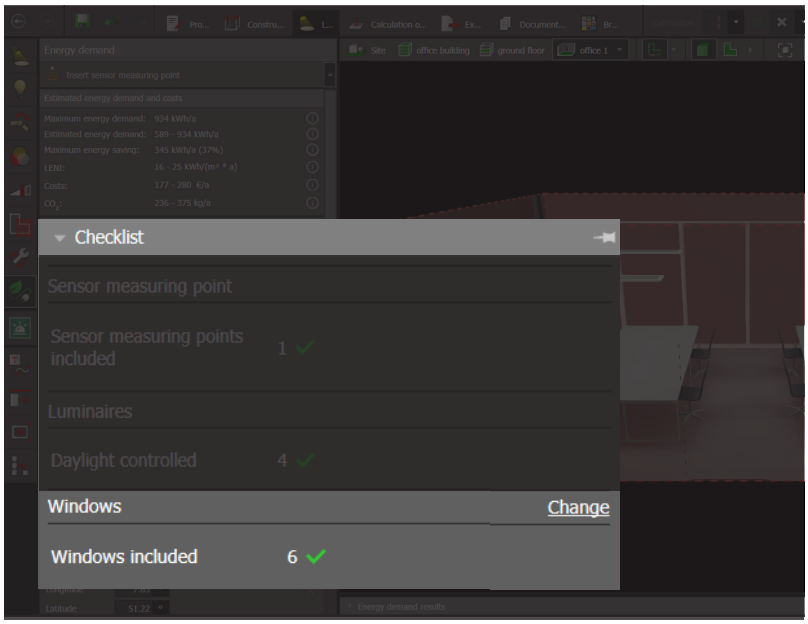
Before



After

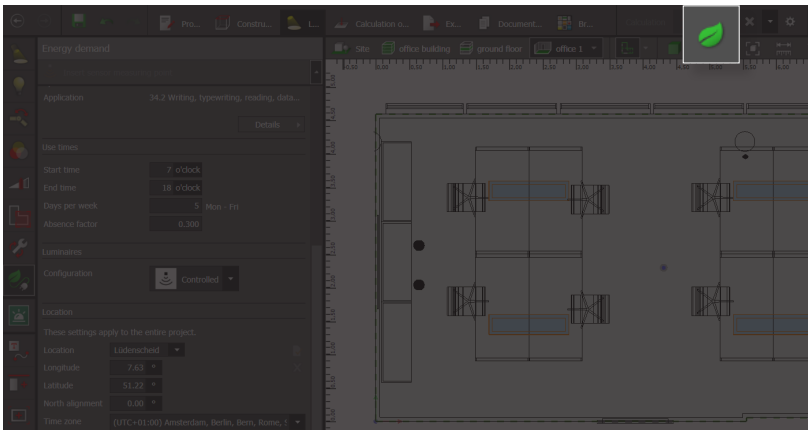
The room to be evaluated must have at least one **window** or a **skylight**.

We have installed 6 windows in our example project, for which there is another tick in the checklist.

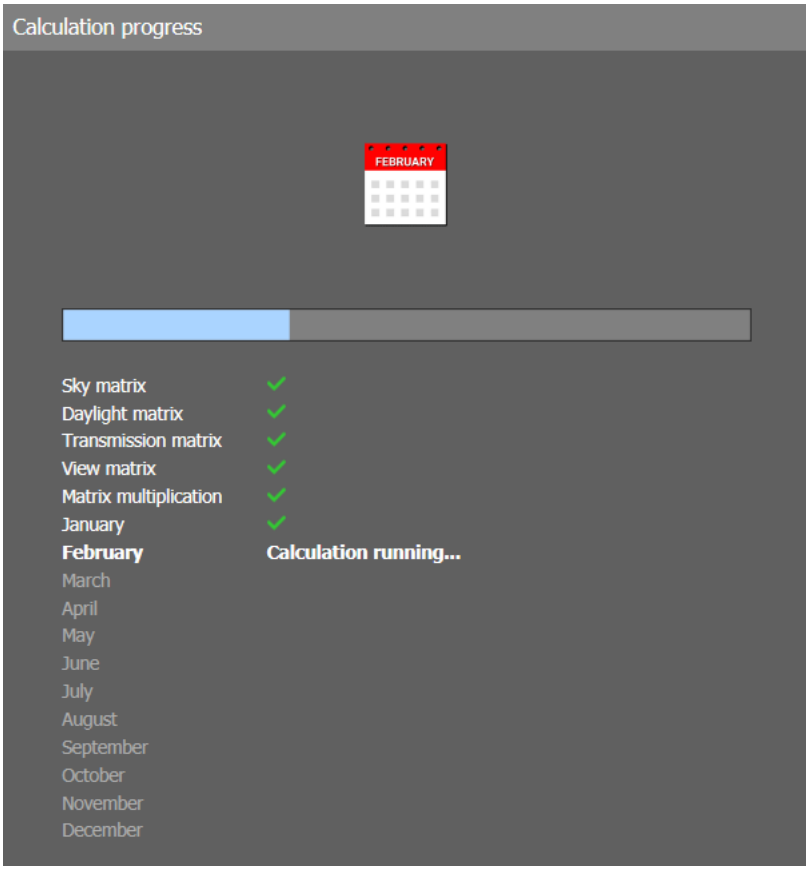


Example project: 6 windows included

Step 4
After checking all entries in the checklist, the **calculation** can be started.

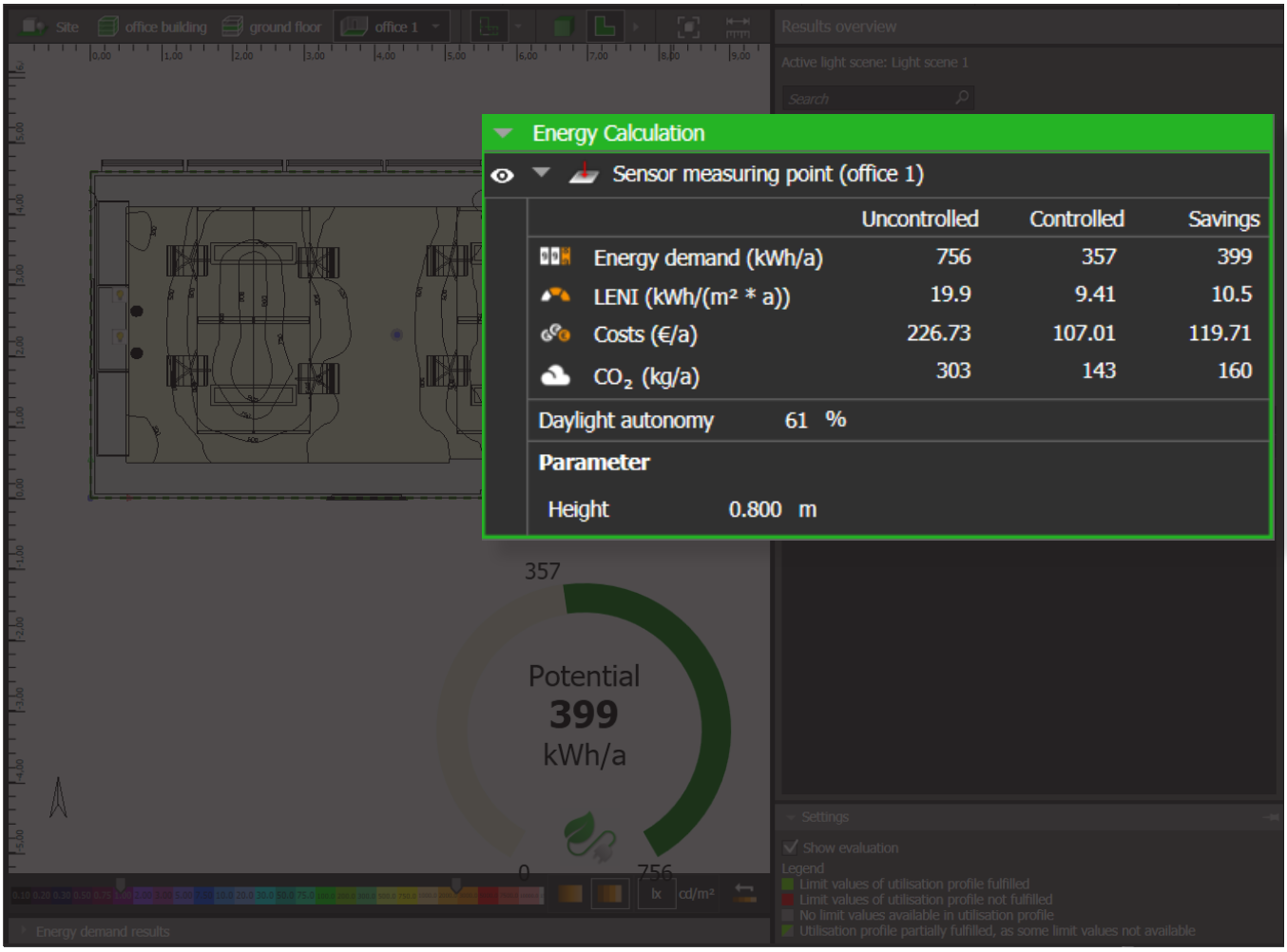


Start calculation

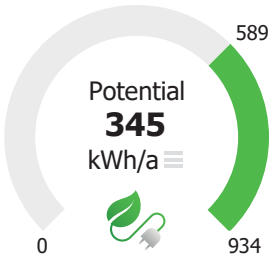


Calculation progress

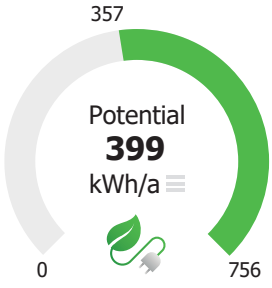
Step 5
The **results overview** summarises the exact energy evaluation.



Here you can see the difference between the general estimate, based on EN 15193, without calculation and the exact energy evaluation, based on hourly calculation.



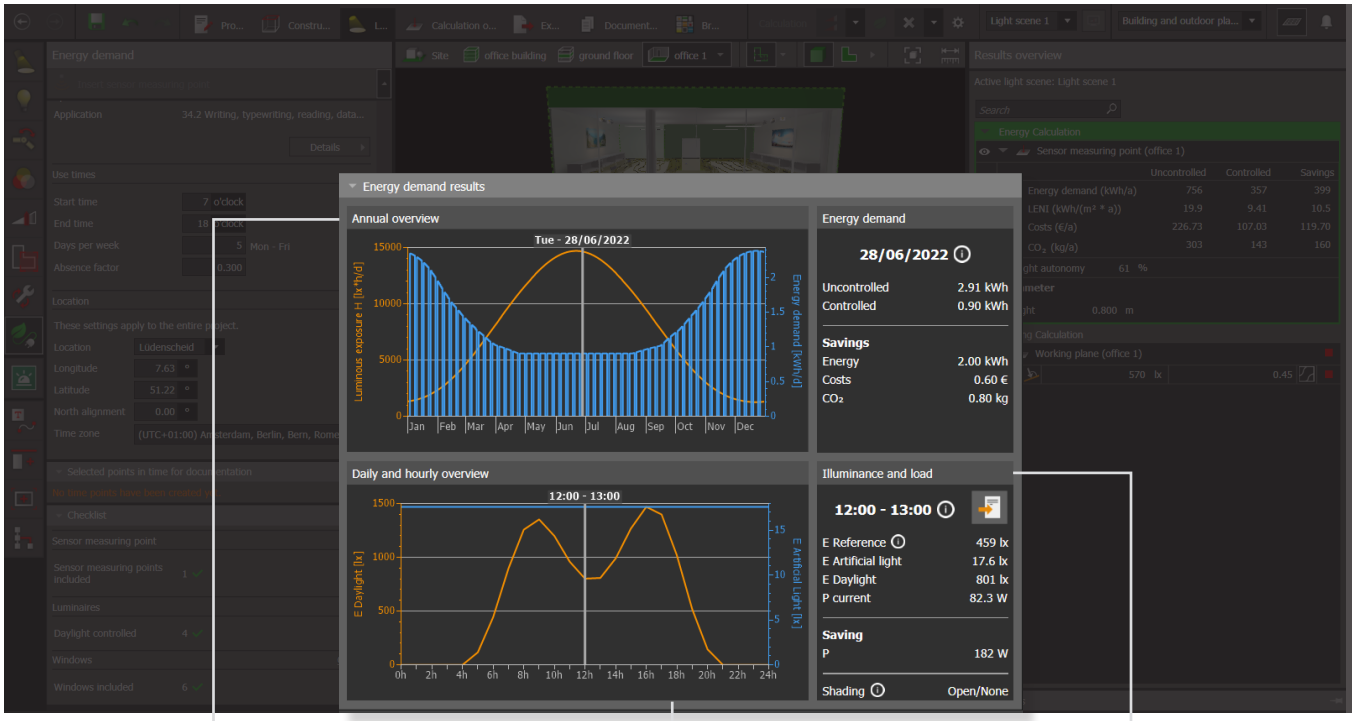
Before calculation:
General estimate



After calculation:
Exact energy evaluation

You will also find the **energy demand results** for the whole year (reference year 2022*). It is presented in two graphs. You can see all the details by moving the timeline to the left or right. Depending on your selection, the data is displayed in the right-hand column. Here you can see exactly when energy is saved by using daylight.

* The reference year is only used to assign the days of the week to the calculated results. The sky model used is the average sky described in CIE 110 without direct sunlight.

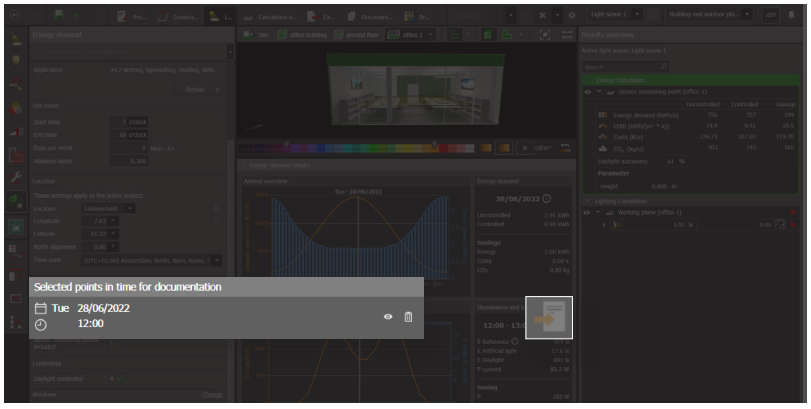


Annual overview, for each day per year
- Proportion of daylight
- Energy demand for artifical light

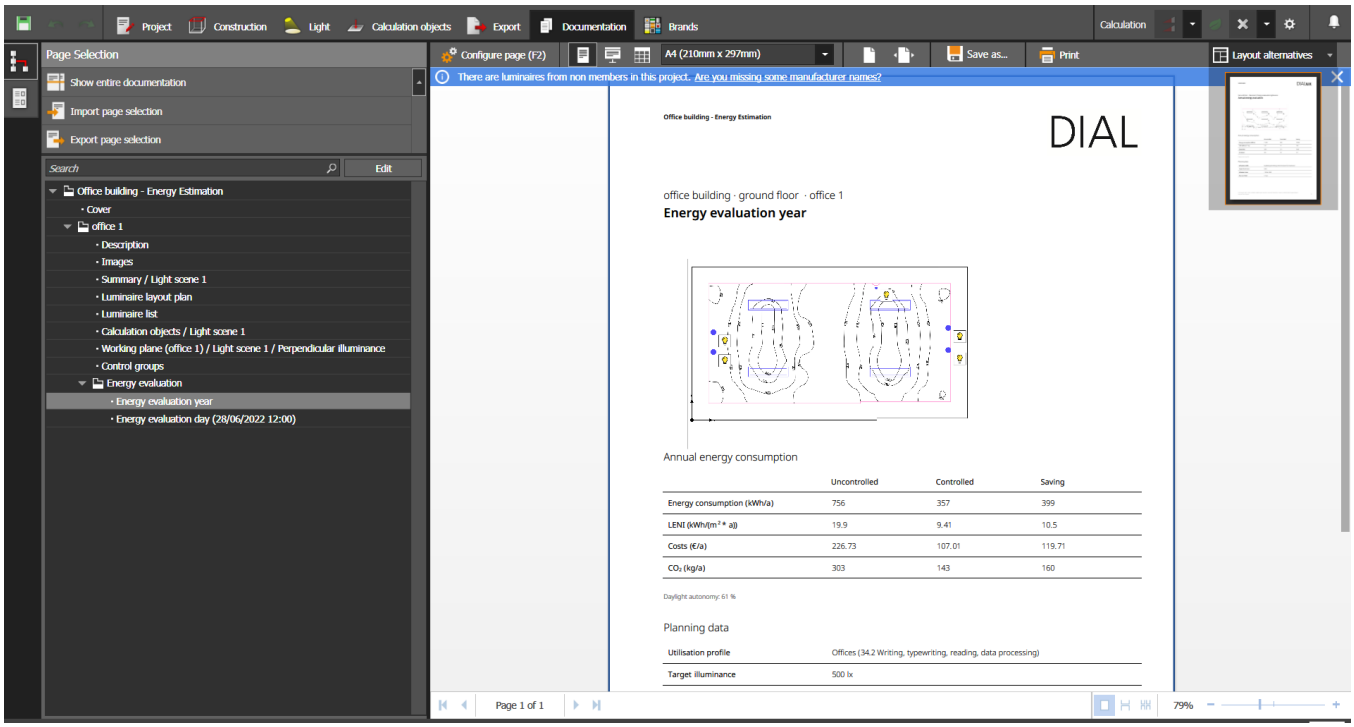
Daily overview, for each hour
- Illuminance of daylight
- Illuminance of artifical light

Hourly overview
Results of the illuminance of artificial light and daylight at this point in the selected hour compared to the reference value.

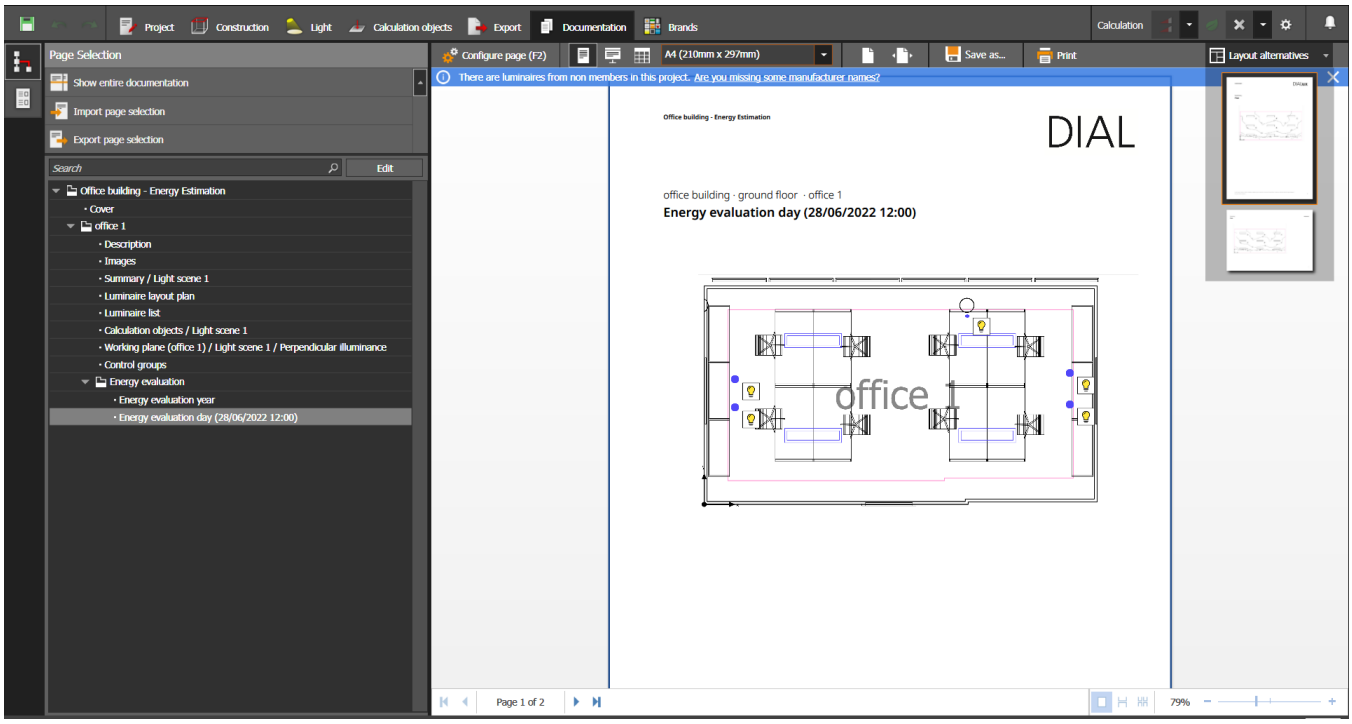
A summary of the entire year is automatically provided for documentation.
If required, you can also specify individually **selected points in time** for even more detailed documentation. Select a date and time and click the button to add the selected information to the documentation. If you prefer, you can add multiple points.

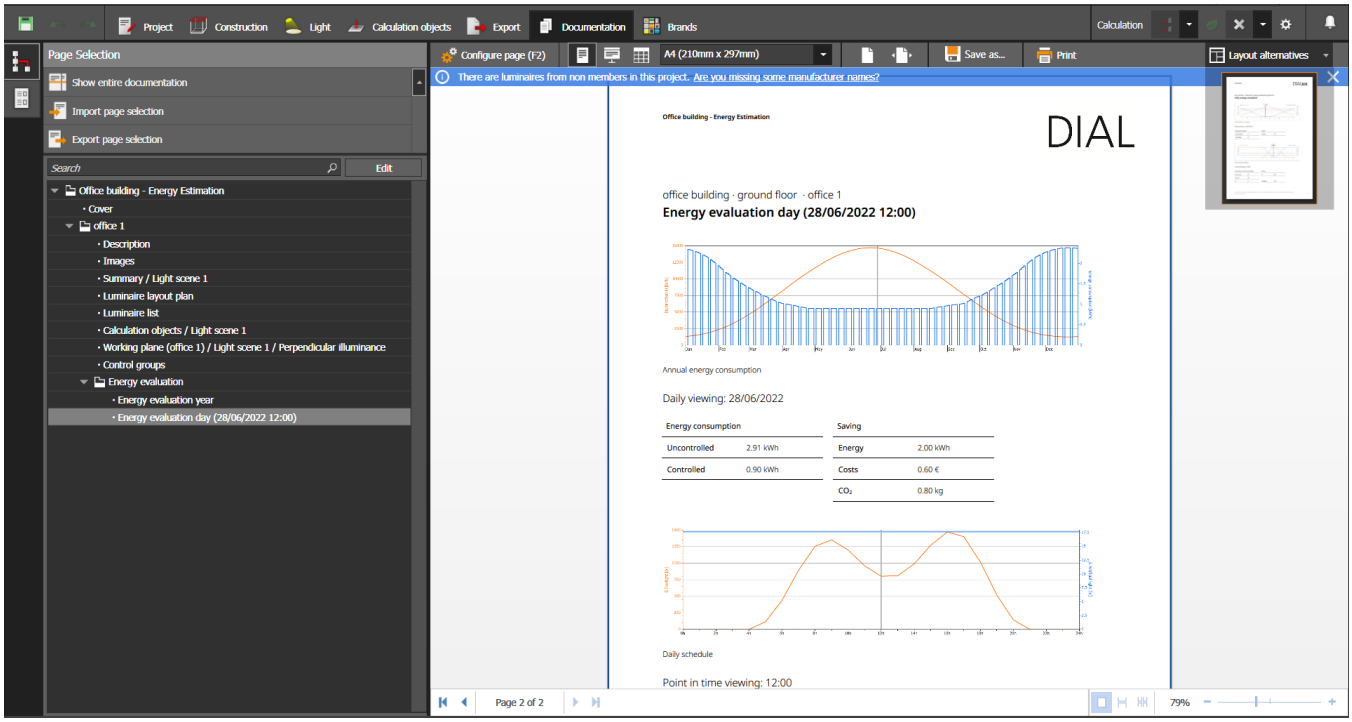


Step 6
Configure your **documentation**. The energy evaluation is listed separately for each room.



Energy evaluation for the entire year





Energy evaluation for a selected point in time