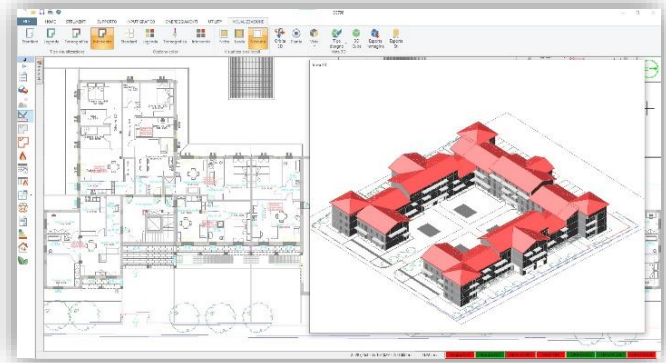# EC700

Energy performance of buildings
Release 11

EC700 allows the calculation of the **energy performance of buildings** in accordance with the **UNI/TS 11300 technical specification**,

taking into account all the services envisaged by the UNI/TS 11300-5 technical specification (heating, cooling, domestic hot water, ventilation, energy needs of escalators and elevators, and lighting).

The software, characterised by a **modular structure**, constitutes the **basic calculation engine**. The combination with **multiple related modules**, integrated into the basic calculation engine or dialoguing with it, allows the designer to perform all activities related to design and energy calculations (tax bonuses, energy certification, verification of legal requirements, energy diagnosis, heat accounting, integrated design and acoustics).

The software allows the expert to operate in the **BIM environment thanks to the import of an IFC file**.

Features

EC700 is Edilclima basic software module for energy performance calculation of buildings. It can be used stand-alone, or with additional modules, available to complete the calculation and reporting capabilities.

The simple and user-friendly interface of EC700 supports the following calculations:
- **dynamic hourly calculation of energy performance of building** according to the European standard UNI EN ISO 52016-1;
- **heat load** to size heating systems (according to EN 12831), **heating and cooling needs** to evaluate the energy performance of the building envelope (according to UNI/TS 11300-1) and **primary energy for cooling** (according to UNI/TS 11300-3);
- **contributions from renewable sources** (thermal solar, photovoltaic, biomass) according to UNI/TS 11300-4;
- estimation of **level of automation of the control systems in the building (BACS)** for each energy service, according to the calculation method of **UNI EN 15232** with the possiblity of determining the primary energy achieved after the improvements;

Importing IFC files allows full collaboration and interaction between designers, without placing any limits on the choice of software to be used for building architectural models, but rather ensuring full interoperability between the tools used and EC700.

The definition of the building's dispersing surfaces can be done either in graphical or tabular form. In particular, the **graphical input** is an advanced, intuitive and reliable tool that speeds up and facilitates the modelling of surfaces considerably, while retaining the advantage of tabular input, as the processed data is always visible, traceable and editable before accessing the next calculation phase.

Next to the drawing, drawn in plan, a 3D view is automatically created, so that the correctness of the design can be verified in real time.

In the **shadow rendering**, the path of the sun and the shadows generated on the building elevations are shown in real time and for each hour of the year. This functionality is useful, for example, for the design of overhangs and for a qualitative assessment of the impact of neighbouring buildings or shading due to the shape of the building.

The functionality allows **specific views** to be set up by indicating the camera point, to generate a real-time animation and export a video in .MP4 format, and to export images related to the current view (in .PNG, .JPG or .BMP format).
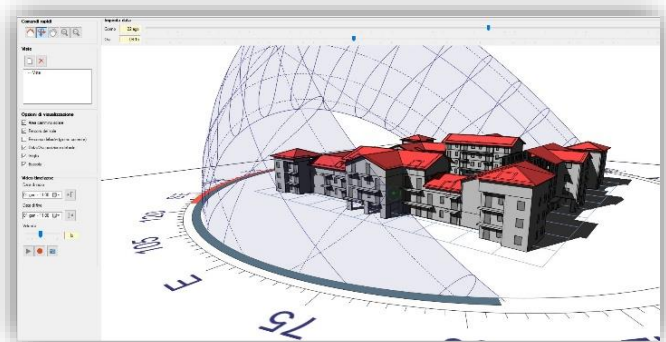


Building envelope and system modelling

The characterisations of the **opaque structures and window components** is particularly quick and easy, thanks to the possibility of taking materials and structures already composed from the respective archives. It is possible to calculate:

- the **thermal transmittance of opaque structures**, according to **UNI EN ISO 6946** and **UNI EN ISO 13370** (for structures on the ground);
- the **thermal characteristics in dynamic regime** according to **UNI EN ISO 13786**;
- . The **thermal transmittance** of windows and doors according to **UNI EN ISO 10077** and of curtain walls according to **UNI EN ISO 12631**.

The definition of the **lineal transmittance of thermal bridges** can be carried out:

- Using the **EC709 Thermal Bridges module**, which includes more than 200 types of thermal bridges calculated according to UNI EN ISO 14683 and UNI EN ISO 10211 standards.
- Using the **Mold Simulator** software, it is possible to perform **finite element simulations of thermal bridges**, in order to both determine their lineal thermal transmittance and asses any risk related to surface condensation and mold formation.

  Using a special **graphic interface integrated in EC700**, the node where the thermal bridge is present is defined in detail and a file compatible with Mold Simulator is exported for subsequent import and processing.
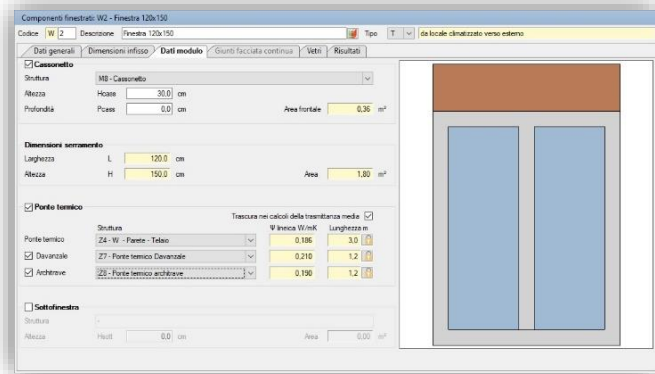
A qualifying element of the software is the **detailed and articulated modelling of the plant subsystems**, which allows any type of management.
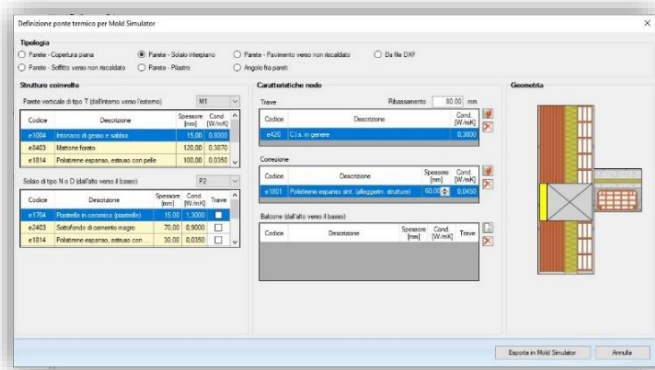
It is possible to manage **multiple circuits**, characterised by different regulation and emission subsystems, and to perform a detailed calculation of **the average temperatures of the heat transfer fluid**, to be used for the analytical evaluation of distribution and generation losses.

The calculation of generation losses, in addition to traditional type generators, is also foreseen for generators with processes other than flame combustion, in both monovalent and multipurpose systems, according to the **UNI/TS 11300-4** technical specification, for example: **heat pumps**, **biomass generators**, **district heating** networks and **micro and small cogeneration** plants.

With regard to the **mechanical ventilation plant**, the software allows you to manage different types of systems (supply only, extraction-only, balanced mechanical ventilation), with or without air treatment (heat recovery, pre-heating and humidification coil).
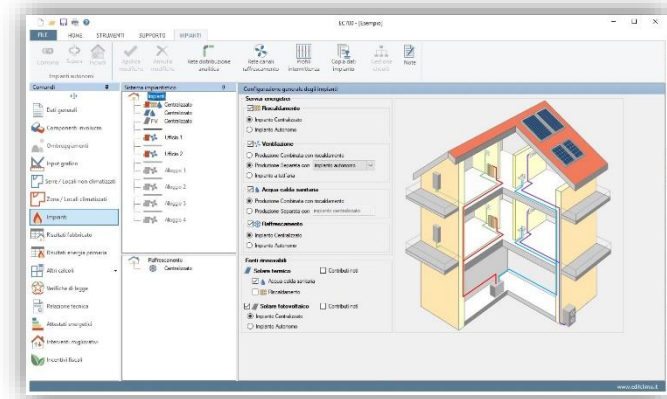
The software allows the simulation of the presence in the building of systems for **transporting people or goods** (e.g. lifts), in accordance with **UNI/TS 11300-6**, as well as the determination of the energy requirements for **artificial lighting** in buildings for non-residential use (indoor rooms, outdoor areas, absorption of parasitic electrical energy due to control and emergency systems), in accordance with **UNI EN 15193.**

The printouts of the calculation results, relating to the building, plant modelling and details of the various dispersion components, can all be exported in **RTF. format**. It is thus possible for the user to make any changes or additions before proceeding to the final printout.