# ESBO | Early Stage Building Optimization

ESBO is a simulation tool for building design optimization based on EQUA's building performance software IDA Indoor Climate and Energy (IDA ICE).

ESBO allows you to experiment with different building designs and equipment in order to predict the consequences on energy use and comfort. Room-level and central HVAC systems may be evaluated, as well as glazing, shading and construction materials - all without the need of creating a complete geometric model of the building.

ESBO will often be launched or downloaded directly from equipment manufacturers' or trade associations' web sites. It will then include tutorials, manufacturer specific products, and special reports focusing on the type of studies that are most relevant for the manufacturer. The result reports may look different for the different manufacturers, but the underlying models are always the same and can be trusted in the same way as all IDA ICE models can.

All tools in the EQUA family of building simulation software are based on the same detailed and validated building model, but the lower editions require fewer inputs and are easier to use. ESBO Light is offered for free, while the higher editions require a license. Projects created in a lower edition can always be opened in a higher edition, but not the other way around. In the higher editions (IDA ICE), all details about the models, such as equations and parameters, may be examined in detail.

More information about IDA ICE
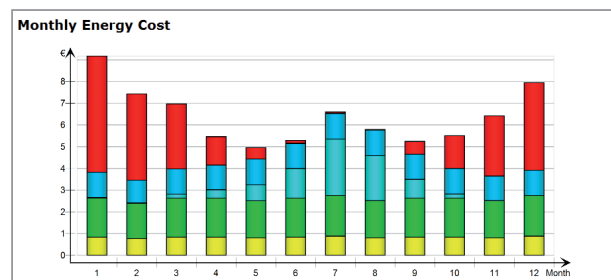can be found at www.equa.se.
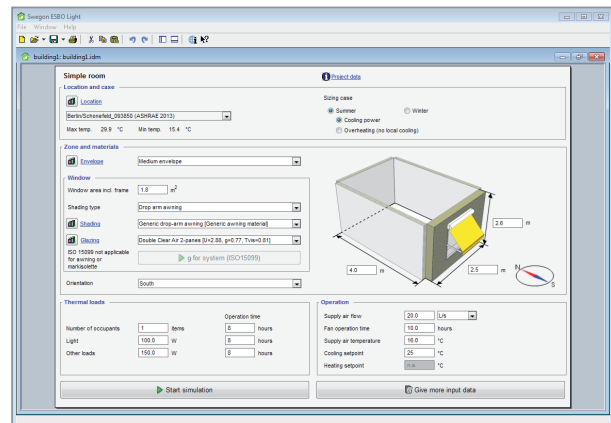
Screenshot from ESBO Light.
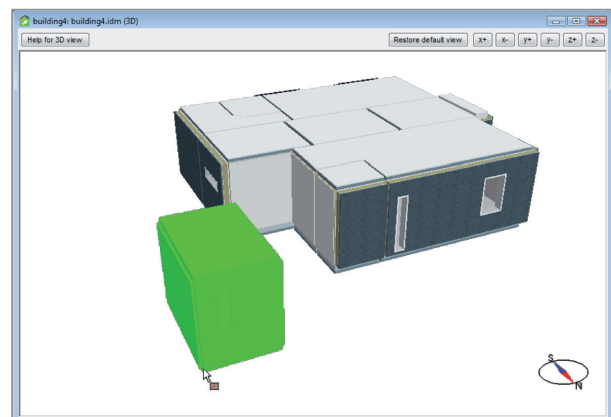
Screenshot from full ESBO.

Monthly Energy Cost

Result report showing monthly energy costs.

Key facts

- Energy and comfort studies

- Study one room or a whole building

- Compare different heating, cooling and ventilation systems

- Compare different glazing, shading and construction materials

- Easy to use

Types of studies

Three types of studies are possible with ESBO:

Energy
Whole year energy use.

Cooling
Cooling design (or summer overheating) according to the ASHRAE heat balance method.

Heating
Heating design (winter heat load) according to the ASHRAE heat balance method.

Climate data

A database from ASHRAE with climate data for thousands of locations all over the world is available. For each location, three types of climate data that correspond to the different studies are provided:

Hourly data
Hourly (IWEC 3) measured climate data that represent a typical year for the location.

Extremely hot days
Extremely hot days for each month of the year.

Extremely cold days
Extremely cold days.

ESBO does not include the effects of heat transmission or air flow between rooms, therefore it is sufficient to model each room type as a separate entity and rooms do not have to be connected other than via central HVAC systems. Internal walls are cut in half and the outermost part of the wall is replaced by perfect insulation. For projects where room-to-room conduction or air flow is essential to the overall performance of the building, the full IDA ICE application should be used instead.

Features

	ESBO Light	ESBO
Single room	■	■
Multiple rooms		■
Rectangular zone geometry	■	■
Arbitrary zone geometry		■
Zone multiplier	■	■
Whole-year simulation	■	■
Batch simulations		■
Case comparing reports		■
Surrounding shading objects		■
3D building visualization		■
Input thermal bridges		■
Input ground heat transfer		■
Input system losses		■
Borehole models		■
Solar thermal collectors		■
License (SEK/lic)	Free	8 000
Support and updates (SEK/year/lic)	Free *	2 400
Available as installation	■	■
Available as cloud service	■	
Support via forum (*)	■	■
Support via e-mail		■

IDA ICE Expert
IDA ICE Standard
ESBO
ESBO Light
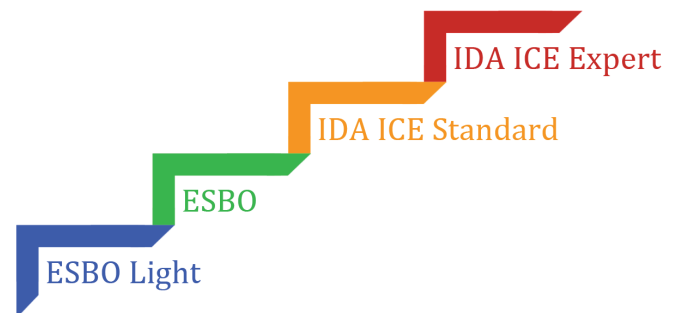
Benefits with full ESBO

More complex geometry
Models can be adapted to suit the geometry of a real project. Several rooms may be studied simultaneously and rooms may have any geometry, also (by CAD import) including complex roof shapes and non-vertical walls. A 3D view of all studied rooms together is available.

Whole-building energy
Full ESBO has a number of features that are needed for a whole-building study, such as thermal bridges, shading elements around the building, ground heat losses, losses in pipe and duct systems etc.

Case comparing reports
Multiple cases can be simulated with a single click and results are compared side by side in the same report.

Renewable energy
Solar thermal, photovoltaic panels, wind mills and borehole heat exchangers are available.

IDA ICE outputs
The full range of IDA ICE outputs are available, including PPD-index, CO_2, humidity and daylight. More user-controllable settings are available.

EQUA.
SIMULATION TECHNOLOGY GROUP