LIVING IN LIGHT VALBY PROJECT

ACTIVE HOUSE EVALUATION



LIVING IN LIGHT



ACTIVE HOUSE EVALUATION HOW TO APPROACH A SCORING RADAR



The level of ambition how "active" the building has become can be quantified into four levels, where **1** is the highest level and **4** is the lowest.



ACTIVE HOUSE EVALUATION of VALBY PROJECT TABLE OF CONTENT



- OVERALL results
- COMFORT results + argumentation
- ENERGY results + argumentation
- CONCLUSIONS

















The amount of daylight in the living room is very high in both cases (aver. DF >3%). Summergarden could be considered an extension of interior usable area and thus, additionally evaluated in daylight factor simulations. In that case, excellent daylight levels (aver. DF > 5%) would be obtained in the living room, without the risk of overheating. 0





Sunlight provision in the living room should be as high as possible between autumn and spring eqinox. More than 10% of probable sunlight hours ensure excellent sunlight and view conditions in a room. Being able to follow the sun is an essential quality of a window.





Results show that ca. 30% of all available sunlight hours can be reached in the living room. It is assumed that summergarden is closed in winter time, thus only traditional facade is being tested.





1.2.1 Maximum operative temperature

"Facade with summergarden" reduces the risk of overheating by increasing the potential of natural ventilation (opening the windows) and by stopping the most critical solar gains with the overhang.

Comfort temperature limits (less than 100h above 26°C and less than 25h above 26°C) are kept in range for "Facade with summergarden". While for "Traditional glass facade", the limits are exceeded over 7 times.

Tin => 26C	Tin => 27C	Tin => 26C	Tin => 27C
751h	299h	79h	20h

TRADITIONAL GLASS FACADE

FACADE WITH SUMMERGARDEN

1.2.2 Minimum operative temperature

"Traditional glass facade" is tested in winter thermal simulation for both cases. The highest score of 1 is achieved, as minimum indoor temperatures are always above 21°C.





In winter, the appartment is ventilated with CO2 controlled mechanical ventilation with heat recovery. Score 2 in Active House evaluation is achieved, with limit value of 1150ppm.

In summer, "facade with summergarden" reduces the interior area by 30%. Thus, higher CO2 niveau is observed when the room is occupied, windows are closed and mechanical ventilation is on. However, it is expected, that summergarden is used as an extention of the living area and then indoor climate would be excellent.





"FACADE WITH SUMMERGARDEN" IN WINTER



TRADITIONAL GLASS FACADE IN WINTER





"FACADE WITH SUMMERGARDEN" IN SUMMER



TRADITIONAL GLASS FACADE IN SUMMER





FACADE WITH SUMMERGARDEN

Results are calculated according to the Danish Building Regulations for Energy frame 2015

CENERGIA



The energy demand in "Facade with summergarden" is 11% lower than the energy demand in "Traditional glass facade". The reason for this is that there are no overheating in the dwelling with "Facade with summergarden".

2.2 ENERGY SUPPLY



Energy supply kWh/ m2, yr

In both solutions there are installed photovoltaics that is producing 56,3 kWh/m2, yr.





The "Facade with summergarden" is providing 3,7 kWh/ m2, yr to it's soundings where the "Traditional glass facade" is having a minor energy demand on 3,0 kWh/ m2, yr.

TRADITIONAL GLASS FACADE



FACADE WITH SUMMERGARDEN





FACADE WITH SUMMERGARDEN

NO OVERHEATING

BALANCED ENERGI DEMAND

GOOD DAYLIGHT FACTOR



