




activehouse.INFO
NETWORK AND KNOWLEDGE SHARING

Active House

Edifici che producono più di quanto consumano

Presentato da:
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Contacts:
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General Secretary
Active House Alliance,



Active House

L'origine del progetto



Piano EU 2020

- 20% Riduzione CO₂
- 20% Energia rinnovabile
- 20% Efficienza energetica

Direttive sulle prestazioni energetiche degli edifici (2010)

- Edifici a energia quasi zero (NZEB)
- Piani nazionali di attuazione



Applicazioni a livello nazionale (2011=>)

- Interpretazione della normativa NZEB
- Metodologia di sviluppo
- Aggiornamento legislativo e dei requisiti edilizi

Active House

La situazione attuale



40% dell'energia mondiale

- viene utilizzata per il riscaldamento e il raffrescamento degli edifici
- il 90% del patrimonio edilizio attuale sarà ancora in uso nel 2050

Trascurriamo il 90% del nostro tempo

- all'interno di edifici,
- almeno il 30% degli edifici non offre un clima interno sano

Le sfide climatiche si giocano a livello globale

- le risorse sono limitate
- i rifiuti aumentano

E' ora di agire!

Le tecnologie già esistenti possono fare la differenza!

Active House Alliance

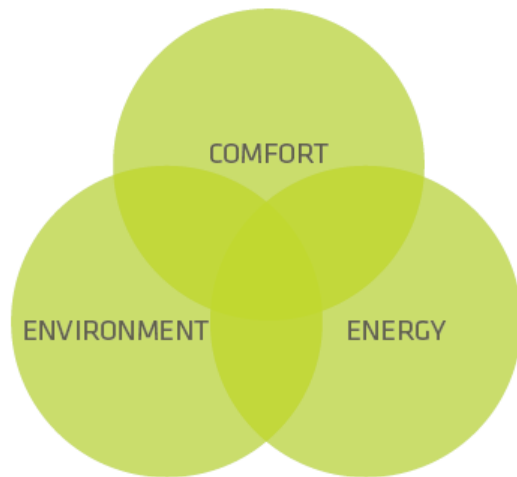
Partner e target groups



Active House: la visione

Edifici che producono più di quanto consumano

L'idea su cui si basa il concetto di Active House è quella di realizzare edifici che permettono una vita sana e confortevole a chi li abita, senza impattare in modo negativo sul clima.



Comfort

– *Crea condizioni abitative migliori*

Una Active House offre ai suoi abitanti un clima interno più sano e confortevole, apportando luce naturale e ventilazione. I materiali utilizzati non impattano negativamente sul comfort e sul clima interno.

Energia

– *Permette agli edifici di ottenere un bilancio energetico positivo*

Una Active House è un edificio ad alta efficienza energetica. Tutta l'energia necessaria al suo funzionamento deriva da fonti di energia rinnovabili integrate nell'edificio stesso o da vicini impianti collettivi di energia.

Ambiente

– *Ha un impatto positivo sull'ambiente*

Una Active House interagisce in modo positivo con l'ambiente circostante, inserendosi in maniera ottimale all'interno del contesto locale, grazie a un uso attento delle risorse e a un basso impatto ambientale durante il suo intero ciclo di vita.

Active House: approfondimenti

Edifici che producono più di quanto consumano

Criteria quantitativi

Classificazione: 1 (migliore) – 4 (accettabile)

Comfort

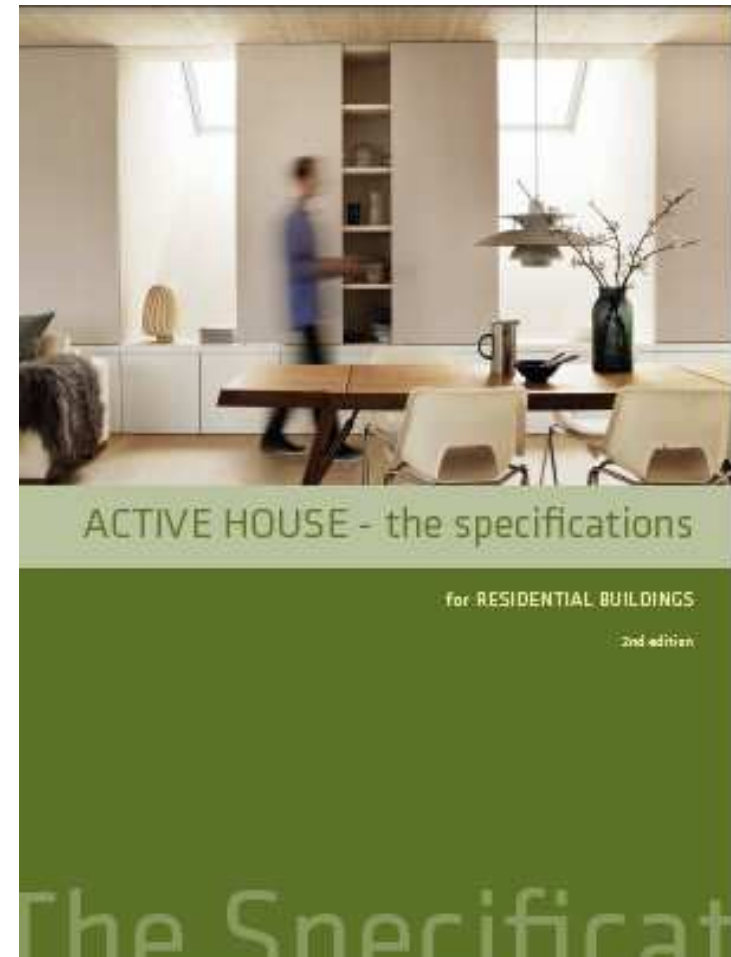
- Luce Naturale
- Temperatura degli ambienti
- Qualità dell'aria all'interno degli ambienti

Energia

- Consumo energetico
- Fornitura energetica
- Prestazione energetica

Ambiente

- Carico ambientale
- Consumo di acqua
- Edilizia sostenibile



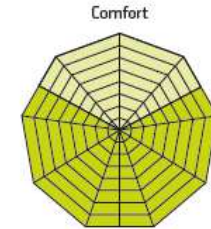
Active House: approfondimenti

Prestazioni nel diagramma radar



Active House: approfondimenti

Comfort



Luce Naturale

PARAMETER	VALUE	CRITERIA	SCORE
1.1.1 Daylight factor		<p>The amount of daylight in a room is evaluated through average daylight factor levels on a horizontal work plane:</p> <ol style="list-style-type: none"> 1. DF > 5% on average 2. DF > 3% on average 3. DF > 2% on average 4. DF > 1% on average <p>Daylight factors are calculated using a validated daylight simulation program.</p>	
1.1.2 Direct sunlight availability		<p>For minimum one of the main habitable rooms, sunlight provision should be available between autumn and spring equinox:</p> <ol style="list-style-type: none"> 1. At least 10% of probable sunlight hours 2. At least 75% of probable sunlight hours 3. At least 5% of probable sunlight hours 4. At least 2.5% of probable sunlight hours <p>The evaluation is made according to British Standard BS 8206-2:2008 "Lighting for buildings – Part 2: Code of practice for daylight".</p>	
TOTAL AVERAGE:			

Temperatura degli ambienti

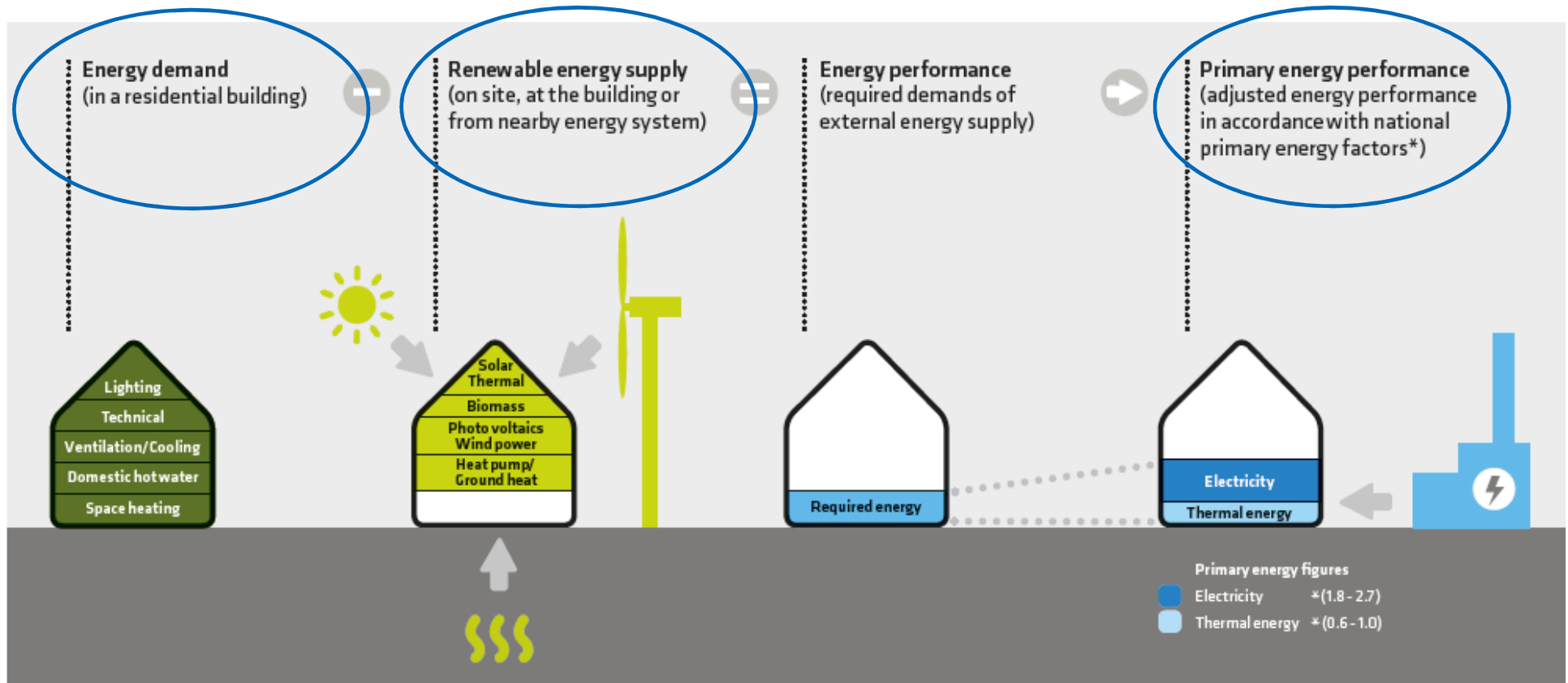
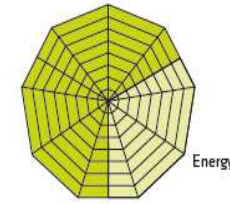
PARAMETER	VALUE	CRITERIA	SCORE
1.2.1 Maximum operative temperature		<p>The maximum indoor temperature limits apply in periods with an outside T_{out} of 12°C or more.</p> <p>For living rooms, kitchens, study rooms, bedrooms etc. in dwellings without mechanical air conditioning and with adequate opportunities for natural (cross or stack) ventilation, the maximum indoor operative temperatures are:</p> <ol style="list-style-type: none"> 1. $T_{in} < 0.33 \times T_{out} + 20.8^{\circ}\text{C}$ 2. $T_{in} < 0.33 \times T_{out} + 21.8^{\circ}\text{C}$ 3. $T_{in} < 0.33 \times T_{out} + 22.8^{\circ}\text{C}$ 4. $T_{in} < 0.33 \times T_{out} + 23.8^{\circ}\text{C}$ <p>T_{in} is the Running Mean indoor temperature as defined in chapter 5.3 Internal temperature, running mean of EN 15251:2007.</p> <p>For living rooms etc. in residential buildings with air conditioning, the maximum operative temperatures are:</p> <ol style="list-style-type: none"> 1. $T_{in} < 25.5^{\circ}\text{C}$ 2. $T_{in} < 26^{\circ}\text{C}$ 3. $T_{in} < 27^{\circ}\text{C}$ 4. $T_{in} < 28^{\circ}\text{C}$ <p>For bedrooms (especially at night time), a 2°C lower value should preferably be used than indicated above as people are more sensitive to high temperatures when sleeping or trying to fall asleep. Also, in kitchens higher temperatures than indicated can be allowed periodically, e.g. during cooking activities.</p> <p>The system should be designed to achieve the values, the users can however choose other settings.</p> <p>Reference: EN 15251:2007.</p>	
1.2.2 Minimum operative temperature		<p>The minimum indoor temperature limits apply in periods with an outside T_{out} of 12°C or less.</p> <p>For living rooms, kitchens, study rooms, bedrooms etc. in dwellings, the minimum operative temperatures are:</p> <ol style="list-style-type: none"> 1. $T_{in} > 21^{\circ}\text{C}$ 2. $T_{in} > 20^{\circ}\text{C}$ 3. $T_{in} > 19^{\circ}\text{C}$ 4. $T_{in} > 18^{\circ}\text{C}$ <p>The system should be designed to achieve the values, the users can however choose other settings.</p>	
TOTAL AVERAGE:			

Qualità dell'aria negli ambienti

PARAMETER	VALUE	CRITERIA	SCORE
1.3.1 Standard fresh air supply		<p>The fresh air supply shall be established according to the below table values for indoor CO₂ concentration in living rooms, bedrooms, study rooms and other rooms with people as the dominant source and that are occupied for prolonged periods:</p> <ol style="list-style-type: none"> 1. 900 ppm above outdoor CO₂ concentration 2. 750 ppm above outdoor CO₂ concentration 3. 1000 ppm above outdoor CO₂ concentration 4. 1200 ppm above outdoor CO₂ concentration 	

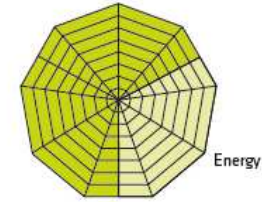
Active House: approfondimenti

Energia



Active House: approfondimenti

Energia



Consumo energetico

PARAMETER	VALUE	CRITERIA	SCORE
2.1 Annual energy demand		<ol style="list-style-type: none"> 1. ≤ 40 kWh/m² 2. ≤ 60 kWh/m² 3. ≤ 80 kWh/m² 4. ≤ 100 kWh/m² 	

Energia rinnovabile

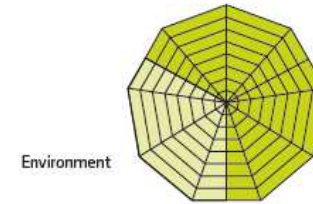
PARAMETER	VALUE	CRITERIA	SCORE
2.2 Origin of energy supply		<ol style="list-style-type: none"> 1. 100% or more of the energy used in the building is produced on the plot or in a nearby system 2. 75% of the energy used in the building is produced on the plot or in a nearby system 3. 50% of the energy used in the building is produced on the plot or in a nearby system 4. 25% of the energy used in the building is produced on the plot or in a nearby system 	

Prestazione energetica

PARAMETER	VALUE	CRITERIA	SCORE
Annual primary energy performance		<ol style="list-style-type: none"> 1. < 0 kWh/m² for the building 2. 0-5 kWh/m² for the building 3. 15-30 kWh/m² for the building 4. ≥ 30 kWh/m² for the building 	

Active House: approfondimenti

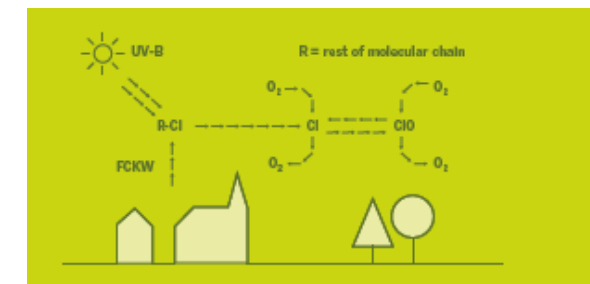
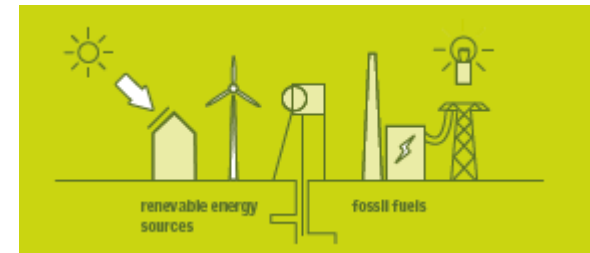
Ambiente



Le sfide che affrontiamo in ambito ambientale si giocano a livello locale, regionale e globale.

Nella progettazione di una Active House è importante che tali sfide vengano prese in considerazione. Soprattutto con l'obiettivo di ottenere una nuova generazione di edifici con un impatto positivo sull'ambiente.

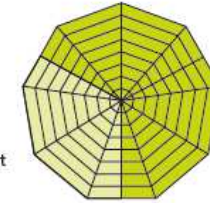
Già in fase di progettazione dovrebbero essere fatte delle considerazioni in merito a come le Active House utilizzano materiali edilizi e risorse.



Active House: approfondimenti

Ambiente

Environment



Carico ambientale

PARAMETER	VALUE	CRITERIA	SCORE
3.1.1 Building's primary energy consumption during entire life cycle		<ol style="list-style-type: none"> < 150 kWh/m²·a < 15 kWh/m²·a < 150 kWh/m²·a < 200 kWh/m²·a 	
3.1.2 Global warming potential (GWP) during building's life cycle.		<ol style="list-style-type: none"> < 30 kg CO₂-eq./m²·a < 10 kg CO₂-eq./m²·a < 40 kg CO₂-eq./m²·a < 50 kg CO₂-eq./m²·a 	
3.1.3 Ozone depletion potential (ODP) during building's life cycle.		<ol style="list-style-type: none"> < 2.25E-07 kg R₁₂-eq./m²·a < 5.3E-07 kg R₁₂-eq./m²·a < 3.7E-06 kg R₁₂-eq./m²·a < 6.7E-06 kg R₁₂-eq./m²·a 	
3.1.4 Photochemical ozone creation potential (POCP) during building's life cycle.		<ol style="list-style-type: none"> < 0.0025 kg C₂H₄-eq./m²·a < 0.0040 kg C₂H₄-eq./m²·a < 0.0070 kg C₂H₄-eq./m²·a < 0.0085 kg C₂H₄-eq./m²·a 	
3.1.5 Acidification potential (AP) during building's life cycle.		<ol style="list-style-type: none"> < 0.010 kg SO₂-eq./m²·a < 0.075 kg SO₂-eq./m²·a < 0.100 kg SO₂-eq./m²·a < 0.125 kg SO₂-eq./m²·a 	
3.1.6 Eutrophication potential (EP) during building's life cycle.		<ol style="list-style-type: none"> < 0.0040 kg PO₄-eq./m²·a < 0.0055 kg PO₄-eq./m²·a < 0.0085 kg PO₄-eq./m²·a < 0.0105 kg PO₄-eq./m²·a 	
TOTAL AVERAGE:			

Consumo di acqua

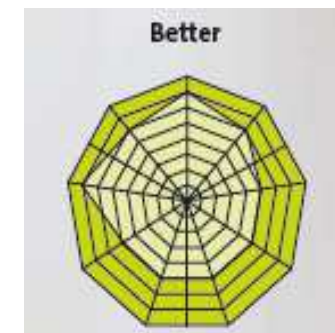
PARAMETER	VALUE	CRITERIA	SCORE
3.2.1 Minimisation of freshwater consumption during building's use ^a		<p>Calculation is based on the national average water consumption per building per year</p> <ol style="list-style-type: none"> Improvement 2.50% (vs average) Improvement 2.30% Improvement 2.20% Improvement 2.10% <p>$\% = \frac{\text{National average} - \text{building consumption}}{\text{National average}} \times 100$</p>	

Edilizia sostenibile

PARAMETER	VALUE	CRITERIA	SCORE
3.3.1 Recyclable content		<p>By weight, the average of recycled content for all building materials (weighted by the proportion of the material in the building) could be:</p> <ol style="list-style-type: none"> ≥ 50% ≥ 30% ≥ 10% ≥ 5% <p>80% of the weight of the building should be accounted for. (In the recycled content, we take into account internal, pre-consumer and post-consumer recycling).</p>	
3.3.2 Responsible sourcing		<ol style="list-style-type: none"> 100% of the wood used is certified (FSC, PEFC) and 80% of the new material suppliers have a certified EMS 80% of the wood used is certified (FSC, PEFC) and 50% of the new material suppliers have a certified EMS 65% of the wood used is certified (FSC, PEFC) and 40% of the new material suppliers have a certified EMS 50% of the wood used is certified (FSC, PEFC) and 25% of the new material suppliers have a certified EMS 	
TOTAL AVERAGE:			

Active House: approfondimenti

Prestazioni nel diagramma radar



Active House: approfondimenti

Strumento a disposizione degli associati

Energy demand, energy supply, Energy balance

	Energy demand / production [kWh]	Primary Energy conversion [-]	Primary Energy [kWh]	Primary Energy [kWh/m2]
Treated floor area [m2]:	190.0			
Space heating				
Total heat requirement space heating	6,460.0			
Coverage of space heating demand				
Heat pump				
Heat production heat pump (space heating)	6,460.0			
yearly COP for space heating	2.69			
Electrical consumption heat pump	2,401.5	2.50	6,003.7	31.6
District Heating	0.0	0.80	0.0	0.0
Boiler	0.0	1.00	0.0	0.0
Electric heating	0.0	2.50	0.0	0.0
Total primary energy consumption Space heating				31.6
Electricity consumption space heating				
Pumps	300.0	2.50	750.0	3.9
Others	190.0	2.50	475.0	2.5
			1,225.0	6.4
Domestic Hot Water				
DHW heat requirement				
Energy content hot water consumption	710.0			

Please specify the energy demand of your building for the different categories listed. Please note that only the blue numbers required your input. The energy demand needs to be specified using the actual energy consumption (kWh). The primary energy conversion needs to be updated according to local regulations/standards. In case you have any additional comments, please feel free to use any of the unused cells..

Normalized measured energy demand for space heating
Energy produced by solarpanels for space heating. If it is not possible to clarify the part of solar heating used for room heating, the total energy produced by HP and solar heating can be typed under "heat production heatpump (space heating)" And the yearly COP for space heating can be written as the COP including the Solar heating production. In case the yearly COP for room heating is not know, the total COP of the heating system can be used

Primary energy conversion factor (related to local / national standards)

Electical consumption of all pumps related to room heating, that is not already part of the COP of the heat pump

Other electricity related to room heating.
In case of overheating og the solar storage tank, the energy consumption for cooling the tank must be typed here

Energy consumption for hot wather
Storage & distribution losses. In the actual case HFL, the losses

Active House: approfondimenti

Manuale sui dettagli tecnici

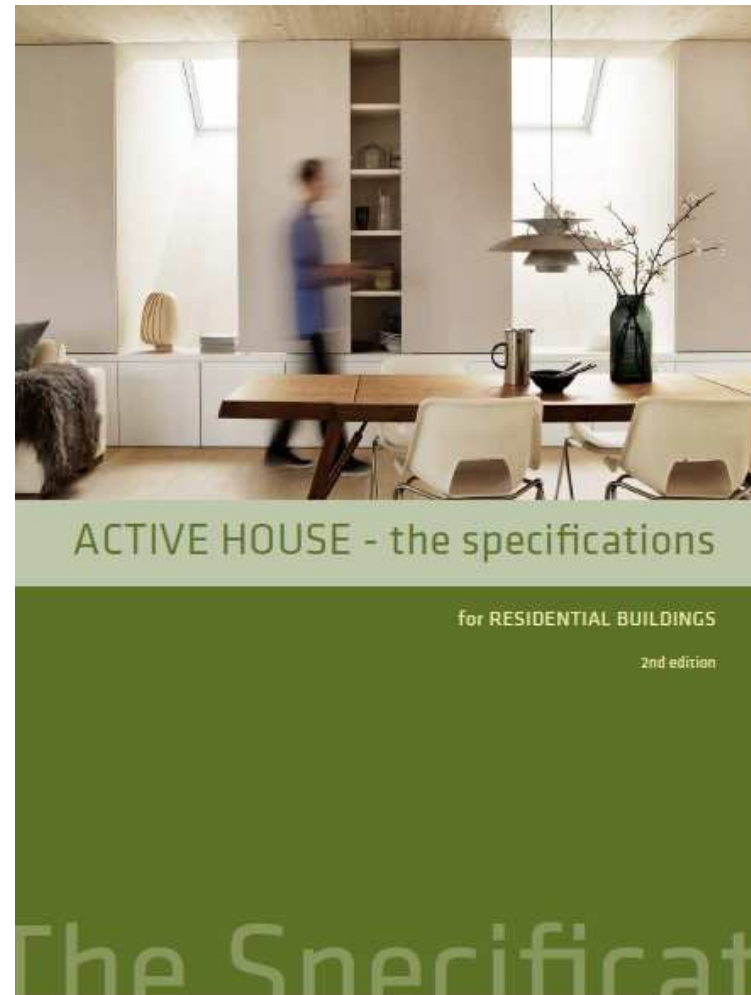
La seconda edizione del manuale può essere scaricato dalla homepage del sito Active House:

www.activehouse.info

Sono disponibili alcune copie.

Iscriviti alla newsletter:

www.activehouse.info



Active House Alliance

Progetti in evidenza sulla homepage del sito



COMPLETION: 13 DECEMBER 2010
BOTTICELLI PROJECT - CASA ECO PASSIVHAUS -
MASCALUCA CT - SICILY, ITALY
Botticelli Project intends to diffuse concept of Active House building which focus the Third Industrial Revolution [UK]



COMPLETION: APRIL 2009
HOME FOR LIFE
LYSTRUP, DENMARK
Home for Life is inspired by a traditional Danish 1 of home has a relatively small surface with many p



COMPLETION: 2009
OSRAM CULTURE CENTRE
COPENHAGEN, DENMARK
A very attractive energy and indoor climate renovation of a former industrial building, now in use as a cultural centre as part of a neighbourhood renewal project.



COMPLETION: AUGUST 2011
CARBONLIGHT HOMES
KENTING, UNITED KINGDOM (GREAT BRITAIN)
The CarbonLight Homes provide bright, healthy living efficiency and a respect for the environment. This project understanding of sustainable living...



COMPLETION: UNDER CONSTRUCTION
HOTT | HOUSE OF TOMORROW
STARKES, NB, NETHERLANDS
HOTT is dutch's first building completely designed Biltbouw and Active House. The layout is based residential program.



COMPLETION: OCTOBER 2009
SOLAR-ACTIVEHOUSE
KRAIS, AUSTRIA
Energy used for heating/hot water - whether it's from wood, coal, oil or natural gas - has literally been burned up. A solution is the solar-activehouse



COMPLETION: MARCH 2010
DE POORTERS VAN MONTFOORT
MONTFOORT, NETHERLANDS
De Poorters of Montfoort are the first houses in the Net principles of Active House, using a sustainable renovation VELUX Group and Danfoss...



COMPLETION: SEPTEMBER 2009
HOUSE OF THE FUTURE
REGENSBURG, GERMANY
How will we live and heat our homes in the future? Regensburg, Germany impressively demonstrates it



COMPLETION: NOVEMBER 2010
SOLHUSET - DENMARK'S MOST CLIMATE FRIENDLY NURSERY
HORSHOLM, DENMARK
Children in Hørsholm can now play in the most climate-friendly nursery in Denmark.



COMPLETION: JUNE 2012
ECO-ENERGY RETROFIT
SEAFORD, UNITED KINGDOM (GREAT BRITAIN)
Retrofitting an 1896 solid wall terraced house within the Trias Energetics concept and Active House principles against a 1990 baseline



COMPLETION: SEPTEMBER 2011
ISOBO AKTIV - A HOUSE FOR THE FUTURE
SANDNES, NORWAY
Jedarius was among the first in Norway to develop this category, ISOBO, was established in 2003. The new active design...



COMPLETION: OCTOBER 2010
SUNLIGHT HOUSE
RENSDAM, VIENNA, AUSTRIA
Sunlighthouse is Austria's first carbon-neutral single-family house. Nestled in a wooded, mountainous region, the home's sloping roof and architectural elements take full advantage of the sun to...



COMPLETION: NOVEMBER 2009
ENERGYFLEXHOUSE
LYSTRUP, COPENHAGEN, DENMARK
EnergyFlexHouse is two one's family houses, each of 1 a test building, and the other building is a one family h



COMPLETION: NOVEMBER 2010
LICHTAKTIV HAUS
HAMBURG, GERMANY
LichtAktiv Haus is an energy-efficient renovation of



COMPLETION: SEPTEMBER 2011
THE FIRST ACTIVE HOUSE IN RUSSIA
MOSCOW, RUSSIAN FEDERATION
The First Active House in Russia is designed to set a new standard for residential house construction in Russia. The house design is based on the Active House principles.



COMPLETION: 18.10.2013
GREAT GULF ACTIVE HOUSE
THOROLD, ONTARIO, CANADA
Great Gulf Active House was achieved through a collaboration architects, the award-winning Toronto architecture firm committed to...



COMPLETION: 2010
LUMINA HOUSE
DŁUGOSZKA, POLAND
Lumina House is an energy efficient, ecological so comfortable, intelligent, optimal and affordable new



COMPLETION: DECEMBER 2012
TRANSFORMATION POORTERS VAN MONTFOORT
MONTFOORT, NETHERLANDS
- DE POORTERS VAN MONTFOORT - Light is an experience, air is the future and space makes living possible.



COMPLETION: 2009
GREEN LIGHTHOUSE
COPENHAGEN, DENMARK
Green Lighthouse is Denmark's first public CO2 neutral then a year in a close public/private partnership.



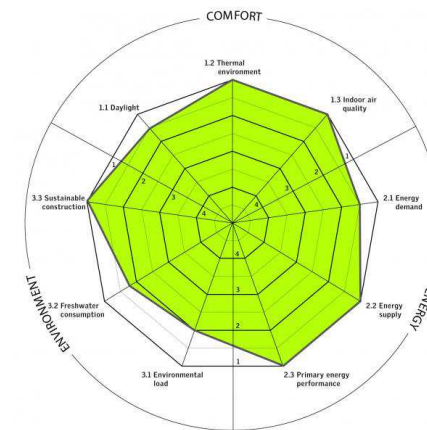
COMPLETION: APRIL 2012
NATURFREUNDEHAUS KNOFELE
SCHNIESSBERG/KNOFELSBERG 4-0852 HIRSCHWANG, AUSTRIA
The old hut burned down in April. New building significantly friendlier than the old one and more user-friendly for 1



COMPLETION: 2011
VELUXLAB
MILAN, ITALY
VELUXlab is the first Italian nearly zero energy building in a University Campus. It is placed in Bovisa Campus of Politecnico di Milano and it is a new laboratory for research.

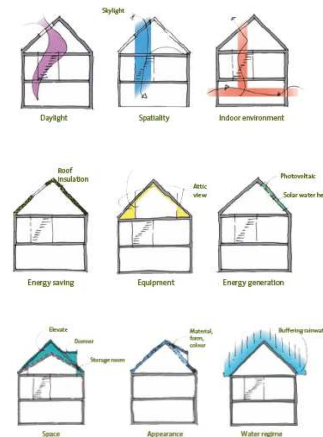
Active House

Great Gulf Active House



Active House

Ristrutturazione Montfoort



Project description

Building name:	De Poorters van Montfoort
Building type:	10 terraced single-family homes
Location:	Montfoort, the Netherlands
Active House evaluation basis:	Renovation
No. of storeys and areas:	3 floors
Heated floor area:	Gross m ² 131 m ² Net m ² 122 m ²
Primary constructions:	Internal and external walls of bricks. Bearing interior walls of concrete. Concrete slabs.
Primary heating supply:	Electricity
Heating system:	Water-water heat pump supplemented by thermal solar collectors
Renewable energy:	Thermal solar collectors and heat pump for hot water supply and room heating. PV for electricity generation.



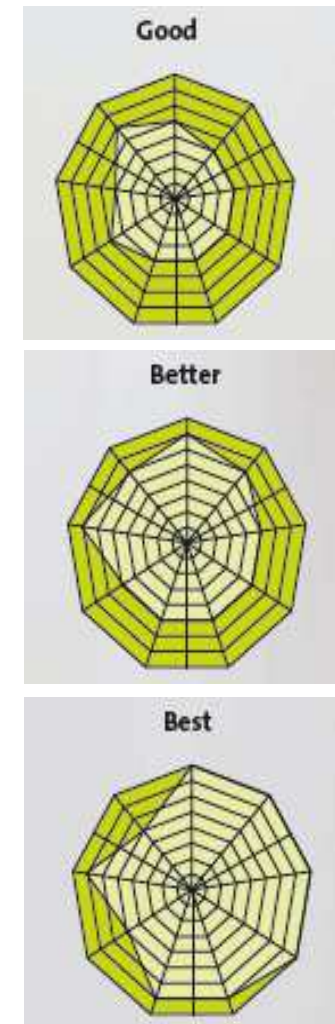
Active House

Ristrutturazione Montfoort



The general Active House Radar is calculated based on the performance before and after the renovation.

- Calculation performance after renovation
- Calculation performance before renovation



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ISCRIVITI ALLA NEWSLETTER

NEWS & KNOWLEDGE

16. OCTOBER 2013
ACTIVE HOUSE COMES TO CANADA
NEWS | TIFFANY FUHLER
October 16: Opening of the Great Gulf Active House in Canada. It is built in Thorold, Ontario, a community located near the Niagara Region and roughly 90 minutes west from Toronto. This

15. OCTOBER 2013
FREE WEBINAR OCTOBER 24: MULTI-COMFORT HOUSE IN BELARUS
NEWS | TIFFANY FUHLER
Hear from the architect, Alexander Kucheravy, about his thoughts and process behind the design of the house. The Multi-Comfort House in Belarus is an international project implemented by SAINT-GOBAIN...

9. OCTOBER 2013
REHVA JOURNAL
NEWS | TIFFANY FUHLER
REHVA Journal is a technical, practical journal for the HVAC industry professionals. It is read by Designers, Consultants, Manufacturers, Investors, Mechanical Contractors, Sales and Representative...

9. OCTOBER 2013
NORDIC PASSIV HOUSE CONFERENCE OCTOBER 15-17 IN GÖTEBORG
NEWS | TIFFANY FUHLER
For the 8th time Nordic and European experts will present and discuss the latest developments, future possibilities and barriers to overcome within low energy buildings. This year the Nordic platform...

30. SEPTEMBER 2013
ENGLISH SYMPOSIUM IN BUDAPEST ON OCTOBER 30TH
NEWS | TIFFANY FUHLER
PROGRAM has been updated and is now complete. REGISTER for € 39,00. The topic of the symposium is the development of Nearly Zero-Energy buildings and the long term political targets for...

HIGH



COMPLETION: DECEMBER 2012
TRANSFORMATION POORTERS VAN MONTFOORT
MONTFOORT, NETHERLANDS
- DE POORTERS VAN MONTFOORT - Light is an experience, air is the future and space makes living possible.



COMPLETION: NOVEMBER 2010
SOLHUSET - DENMARK'S MOST CLIMATE FRIENDLY NURSERY
HORSHOLM, DENMARK



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ACTIVE HOUSE NEWSLETTER 15:2013 OCTOBER 2013

UPCOMING EVENTS
Join us on October 30: Symposium Sustainable comfort in buildings in Budapest! The topic of this year's Active House symposium is the development of nearly zero-energy buildings and the long term political targets for sustainable buildings in Europe. The talks are divided into three sessions:

- political targets and the human need for sustainable buildings with healthy comfort
- an overview of the Hungarian experience and examples of local projects
- a presentation of the Active House specifications and examples of international green architecture.

The symposium will end with a plenary debate on sustainable buildings with focus on human well-being and comfort. Complete program. Participation fee: € 39,00. To register.

October 24: Webinar Multi-Comfort House in Belarus
with the architect, Alexander Kucheravy, about his process behind the design of the house. The Multi-Comfort House in Belarus is an international project implemented by SAINT-GOBAIN, VELUX (Belarus), entry Karkasnyy Dom (Modern Frame House LLC) and designed by Belarusian architect Alexander Kucheravy. The house was opened for visitors on 23 May 2013. Find more information about the The Multi-Comfort House in Belarus here. Date and time: 24 October from 15:00 - 16:00 CET. Send us an e-mail at gscontact@activehouse.info if you wish to follow the webinar.

Nordic Passiv House conference
The Active House Alliance participates at the sixth Passivus Norden conference where Nordic and European experts will meet, present and discuss the latest developments, future possibilities and barriers to overcome within low energy buildings. The conference will take place from October 15-17 and include a presentation by Carsten Østergaard Pedersen on the Active House vision for buildings.

NEWS
Active House open in Canada
The Great Gulf Active House in Canada opens on October 16. Niels Bohr Abramson, the Danish ambassador to Canada will be the guest of honor at this official opening. Follow the building through LIVE updates. If you wish to attend RSVP to activehouse@aretequif.com.

Active House Alliance nominated in Denmark
The national Danish radio and the newspaper "Information" launched a national project with the purpose of sharing knowledge about sustainable projects which are initiated by citizens, businesses and organisations. More than 400 projects were presented. The Active House Alliance made it to the final round as one of 27 projects.

CESBA
CESBA is on the one hand a methodology to assess existing and new buildings and on the other hand a framework of EU projects to reach higher convergences by a common process. Active House will participate in the next workshop to be organized in October on the 21-23 in Austria.

Sustainable Buildings: an EU Commission initiative
The European Commission wants to gather views and additional information on the possible introduction of EU wide measures to achieve better environmental performance of buildings. The Active House Alliance has given comments, input and additional information to the European Commission.

Busy summer
During the summer, the Active House Alliance gave presentations and organized side events at several European conferences on sustainable buildings. Among others: CLIMA2013 and SB13 both organized in Prague, The Ventilative Cooling conference in Athens, as well as being present at PLEA in Munich.



Grazie per l'attenzione!

Vuoi far parte dell'Alleanza e seguirne gli sviluppi?

www.activehouse.info

Contatta la segreteria:

secretariat@activehouse.info

edilportale[®] TOUR 2014

La mostra convegno in 18 tappe
su Efficienza energetica,
Luce e Ventilazione naturale,
Acustica e Active House.

in collaborazione con **VELUX[®]**

partner **SCHÜCO** **ROCKWOOL** **KNAUF**

Genova, 21 maggio 2014

**Il protocollo Active House in clima mediterraneo:
ricerche e sperimentazioni sviluppate nel laboratorio VeluxLAB al Politecnico di Milano**

Marco Imperadori – Politecnico di Milano



POLITECNICO DI MILANO

VELUX® lab





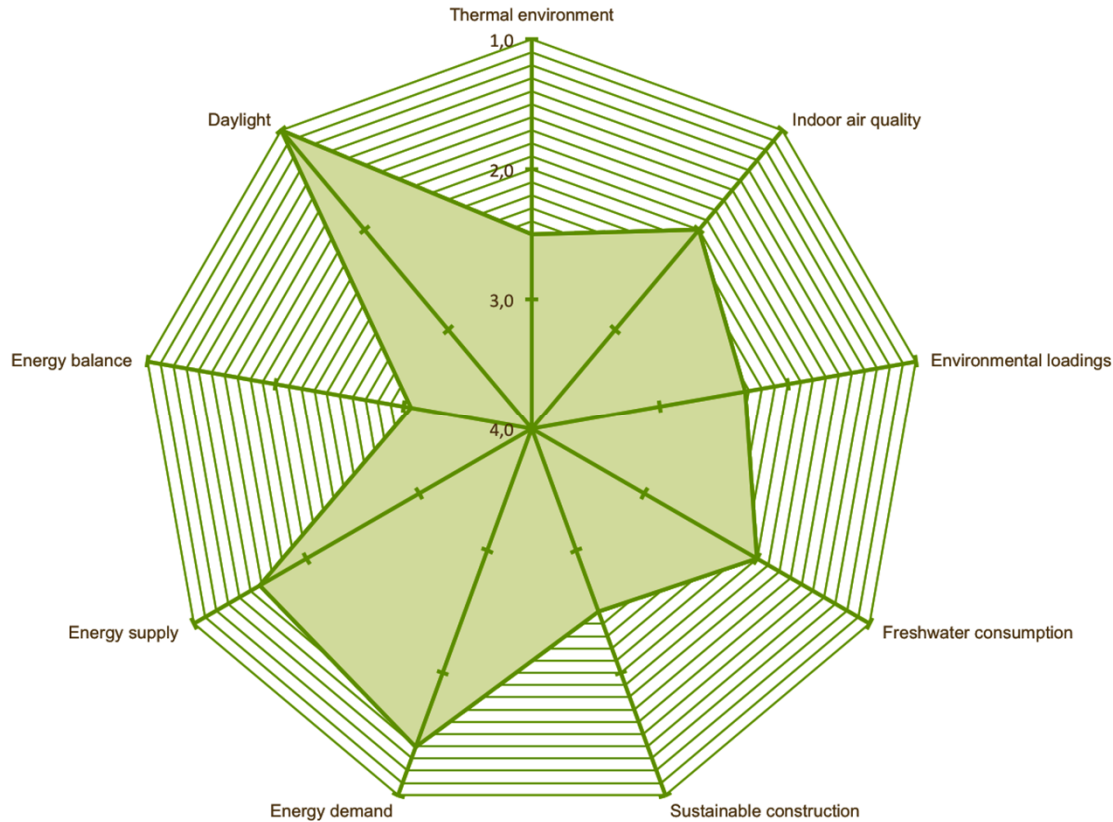
Non è la specie più forte o la più intelligente a sopravvivere ma quella che si adatta meglio al cambiamento.

Charles Darwin, L'origine delle Specie, 1859





Dati Radar

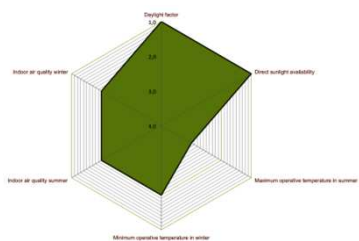


activehouse.INFO
NETWORK AND KNOWLEDGE SHARING

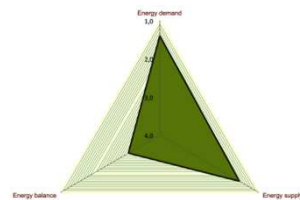
Primo edificio italiano "Net Zero Energy" inserito in un campus universitario

Prima Active House registrata in Italia

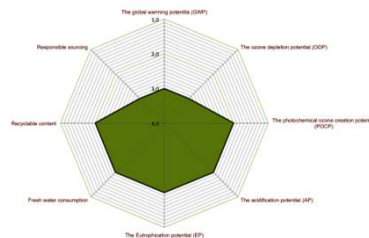
Comfort



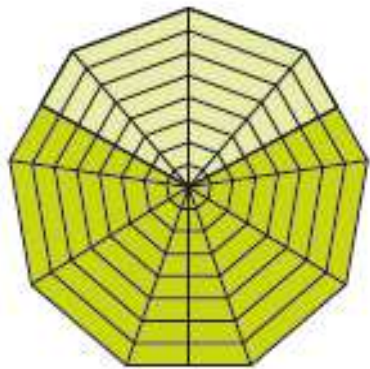
Energia



Ambiente



COMFORT





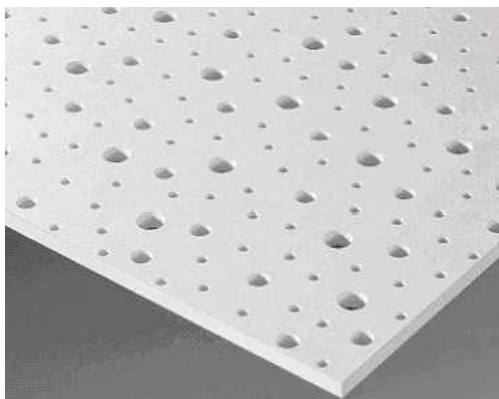
Componenti



Struttura in acciaio, solaio a pavimento in lamiera grecata e getto collaborante



Iper-isolamento in poliuretano, polistirene, in lana minerale e lana di legno



Pannello in gesso e zeolite KNAUF-CLEANEO



Vetrare triplo vetro basso emissivo. Serramento a taglio termico SCHÜCO

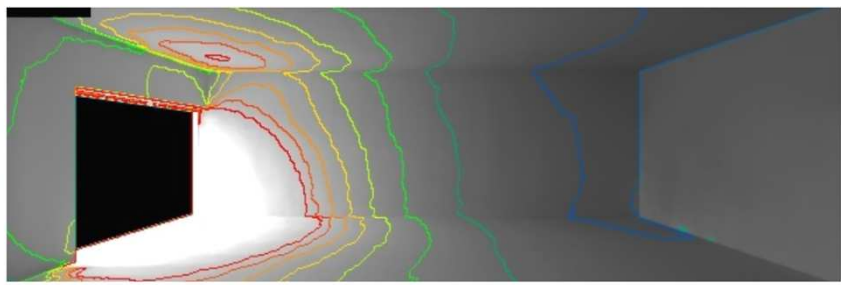


Finestre tetto VELUX ad alte prestazioni

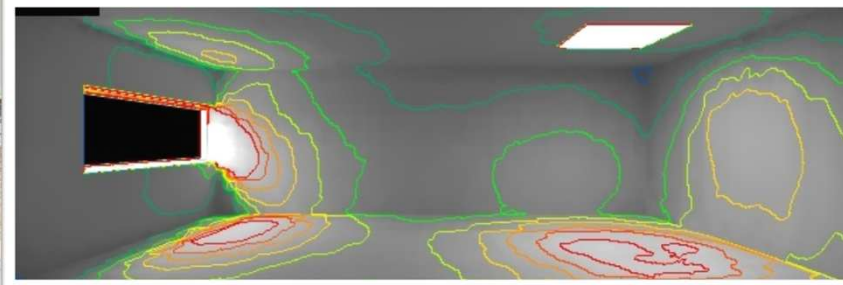
Controsoffitto "Knauf-Cleaneo"



Distribuzione della luce con aperture zenitali



6m² superficie vetrata
154 lux medi



4m² superficie vetrata (-33%)
225 lux medi (+45%)

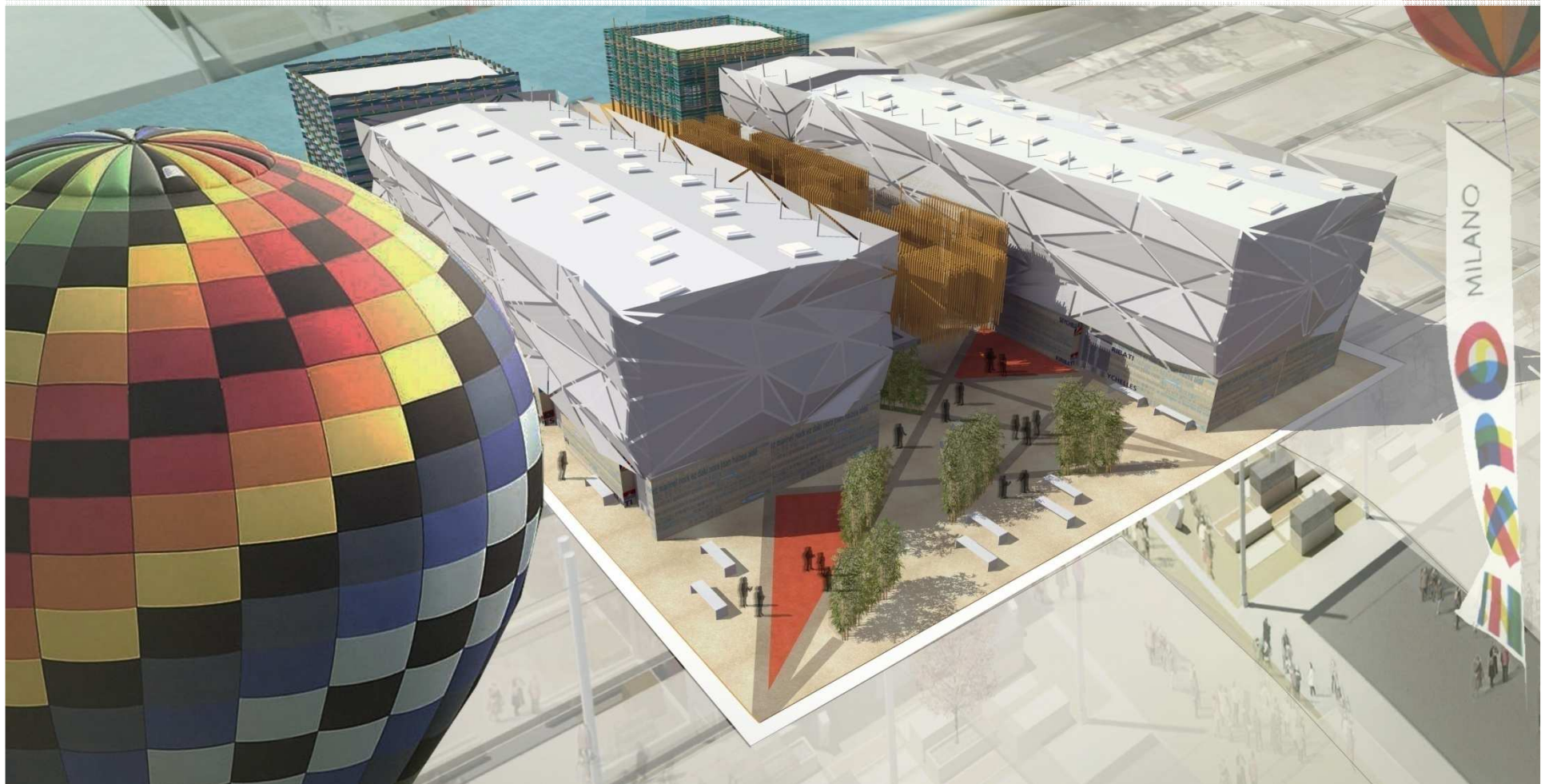


Supreme Court Singapore (Norman Foster)
Facciata Taltos



Il Cluster "Island, sea and food"

RYTHM OF DISCOVERY



Team:

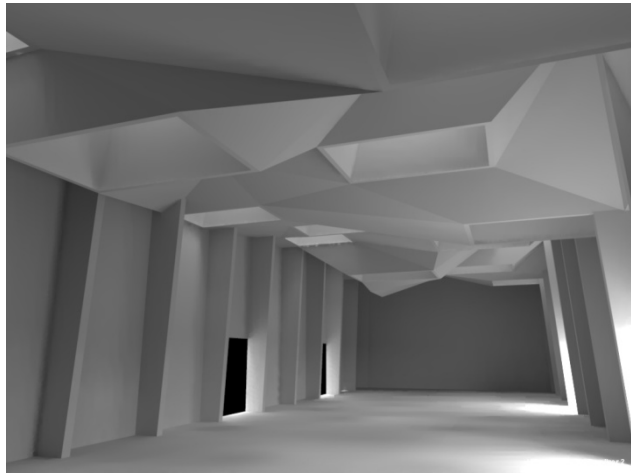
Giuliana Iannacone
Andrea Vanossi
Paola Trivini
Valentina Gallotti
Chiara Valsecchi



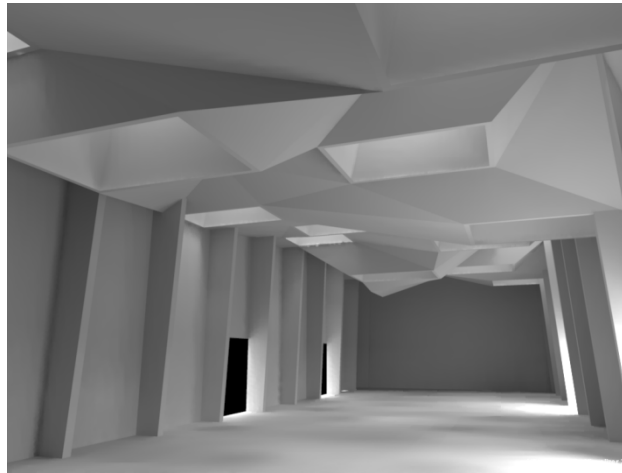
MILANO 2015

NUTRIRE IL PIANETA
ENERGIA PER LA VITA

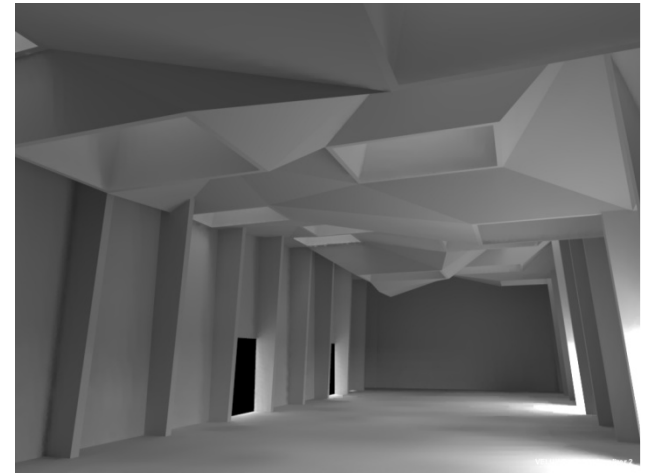
Analisi illuminotecniche



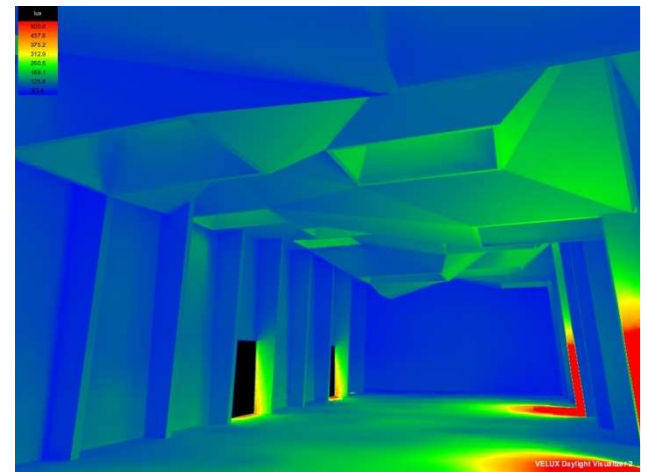
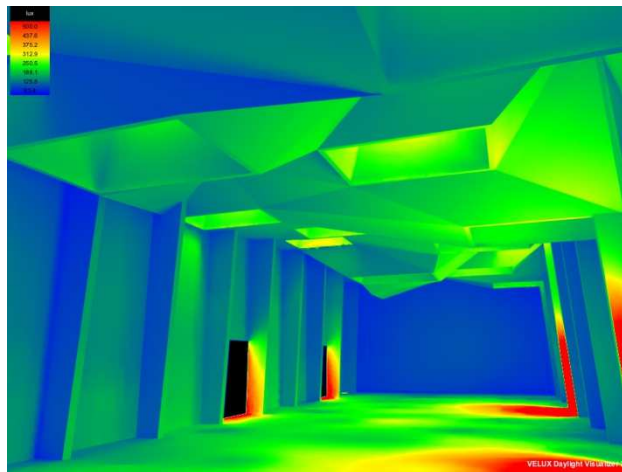
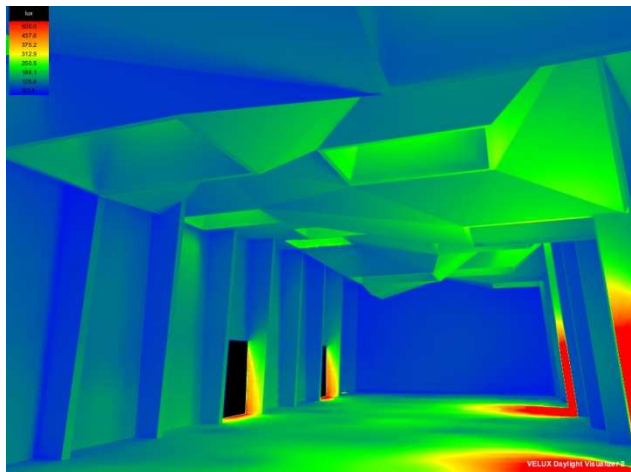
21 aprile



21 giugno



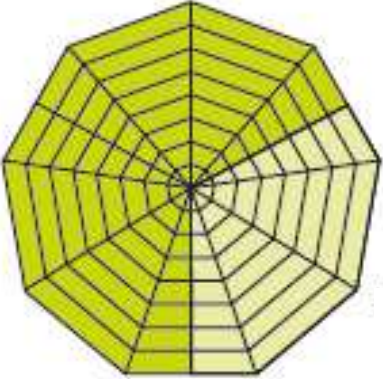
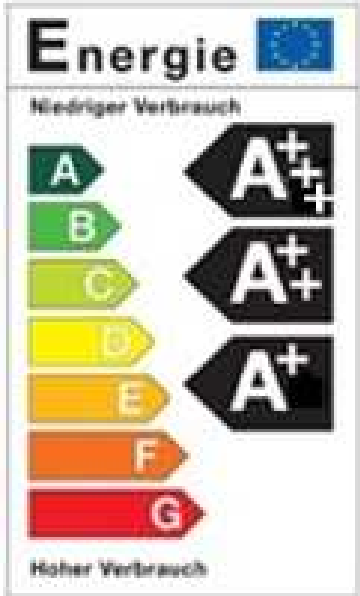
21 ottobre



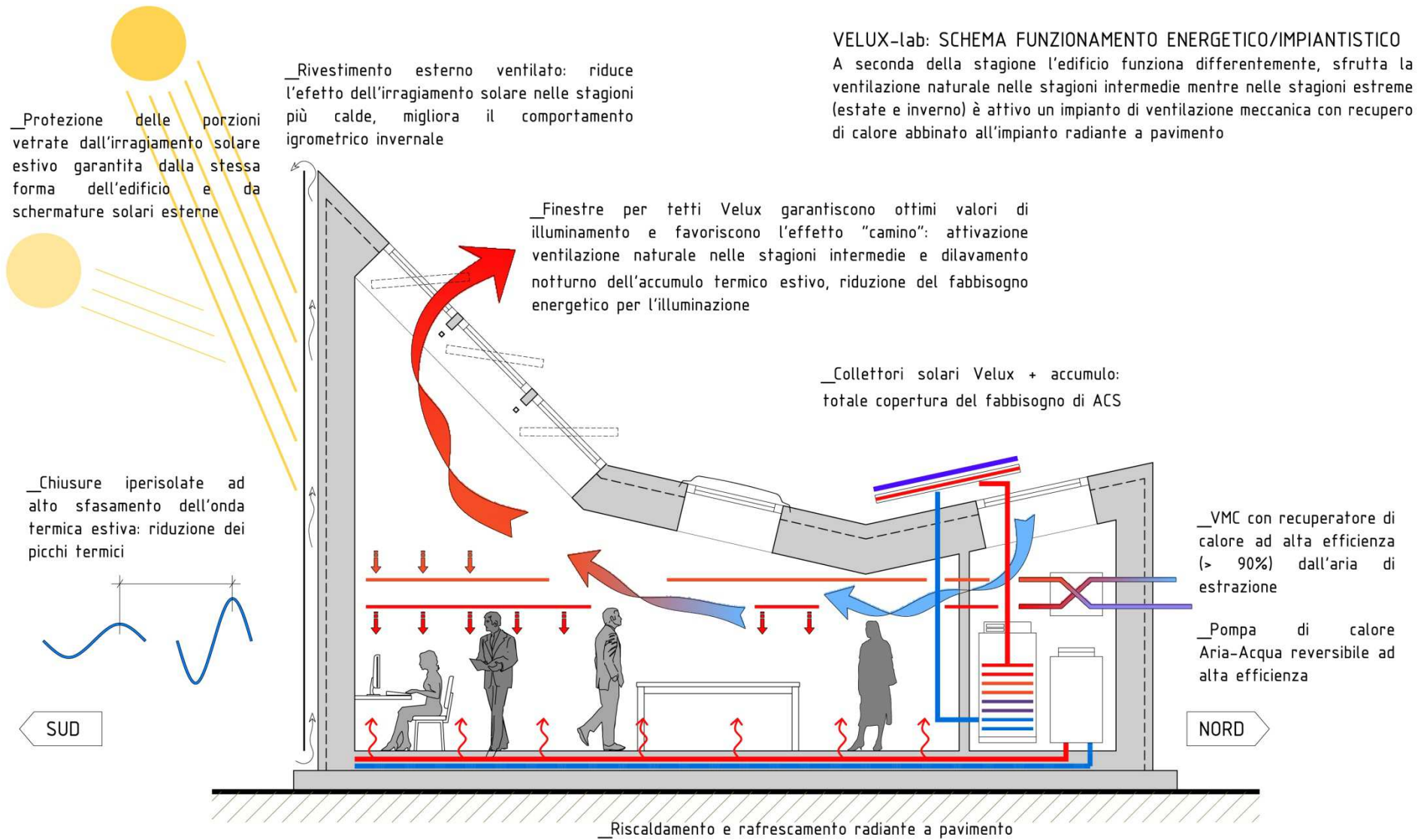
ILLUMINANZA - Padiglione EST - Cielo parzialmente coperto

In condizioni di cielo coperto è possibile verificare ottimi livelli di illuminamento dell'intero spazio espositivo con valori di illuminanza omogenei e prossimi ai 250 lux. È quindi possibile verificare l'efficacia dei "Vulcani di luce" anche in condizioni meteo meno favorevoli.

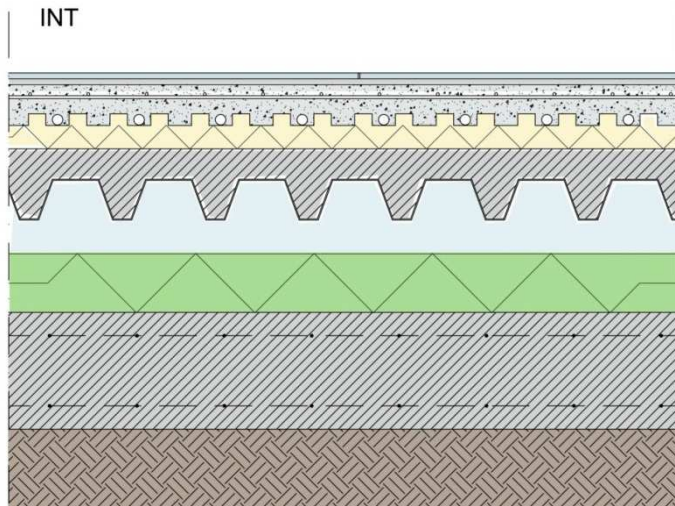
ENERGIA



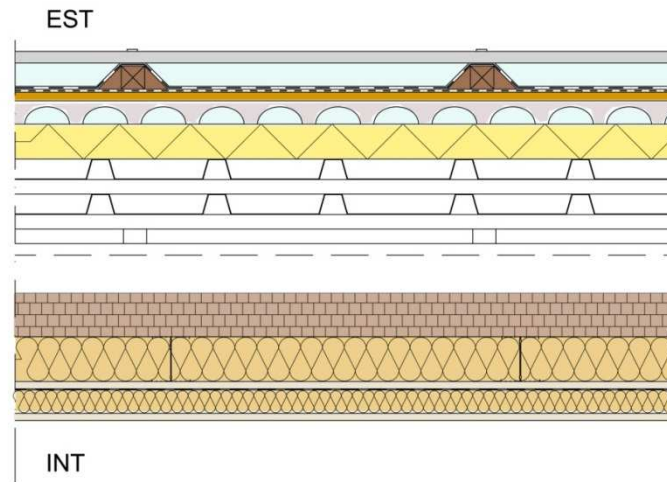
Schema energetico



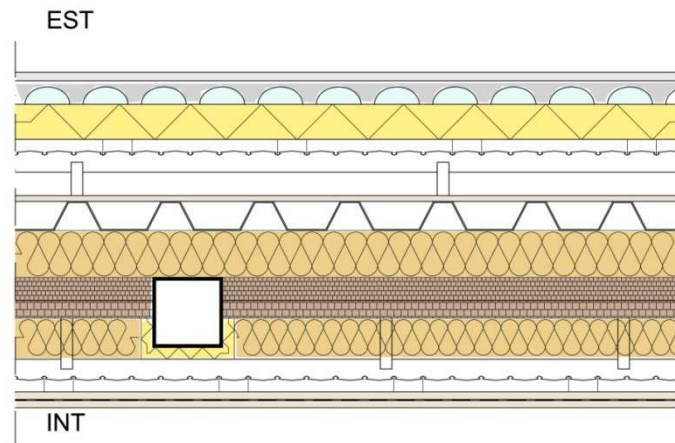
Prestazioni



▲ **Solaio controterra $U = 0.214 \text{ W/m}^2\text{K}$**
Ground floor slab



▲ **Copertura $U = 0.133 \text{ W/m}^2\text{K}$**
Roof



▲ **Chiusura esterna $U = 0.124 \text{ W/m}^2\text{K}$**
External wall



Impianti



Ventilazione meccanica (portata massima 470 m³/h) con recuperatore di calore (>90%)

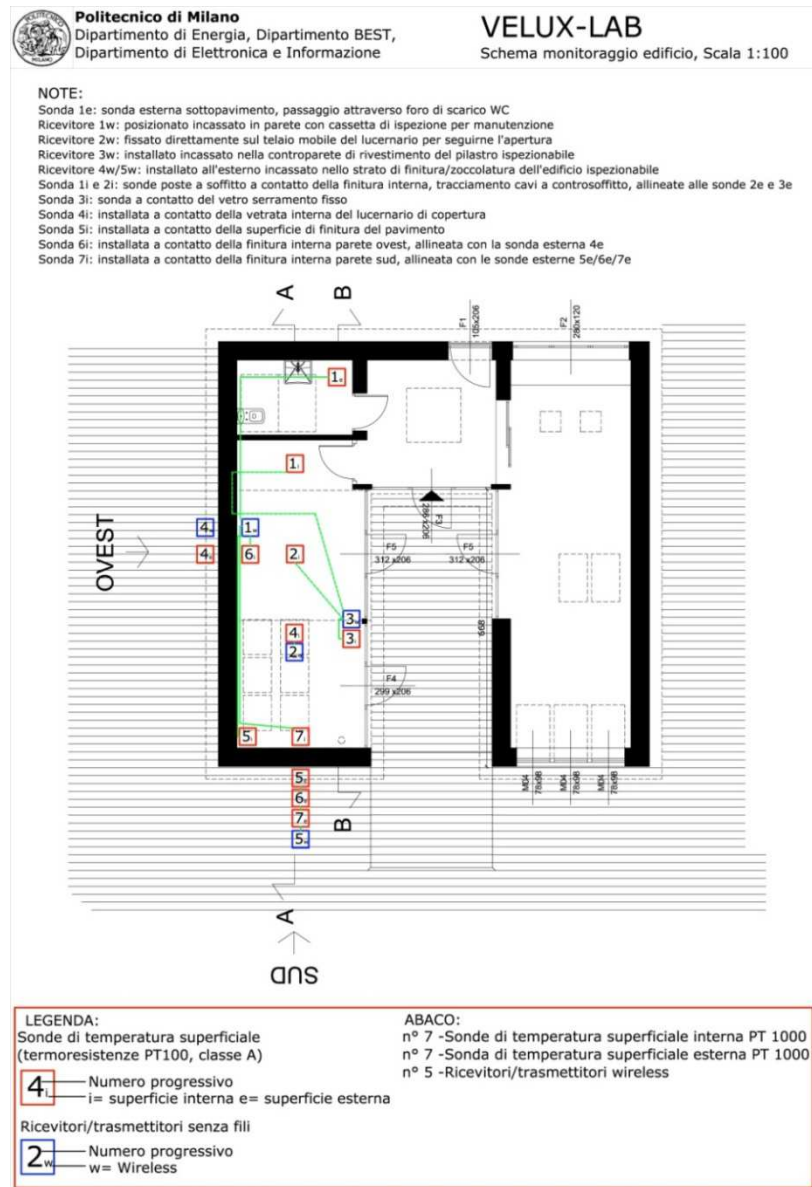


Riscaldamento (90 W/m²) e raffrescamento (30 W/m²) radiante a pavimento

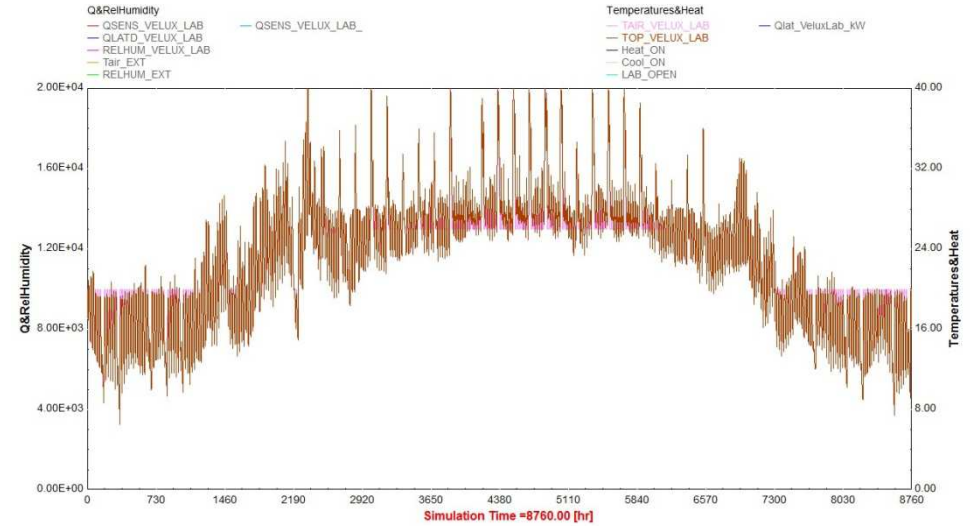
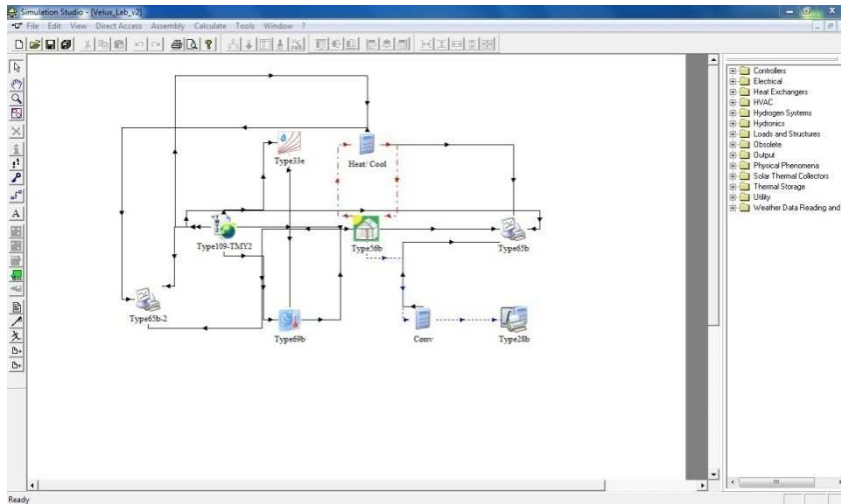
Pompa di calore aria-acqua (7 kW per riscaldamento, 6.1 kW per il raffrescamento). Solare termico (3 collettori solari, 160 l serbatoio di accumulo)



Sistema di monitoraggio Wireless

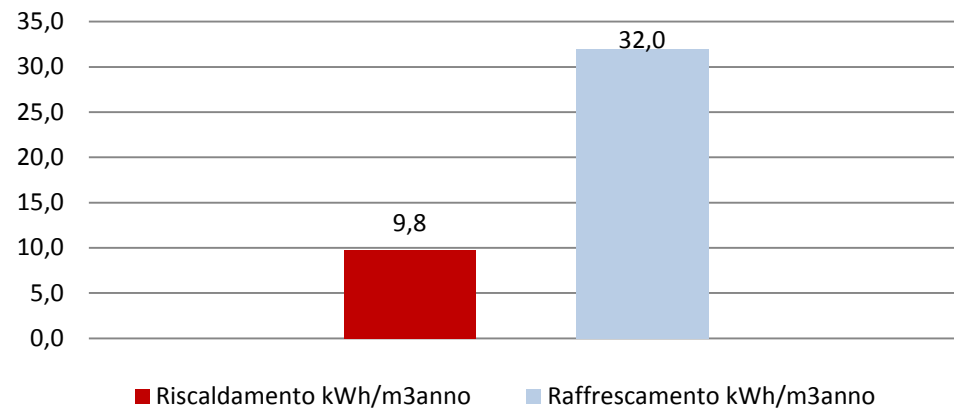


Simulazioni energetiche e sistema di servizi

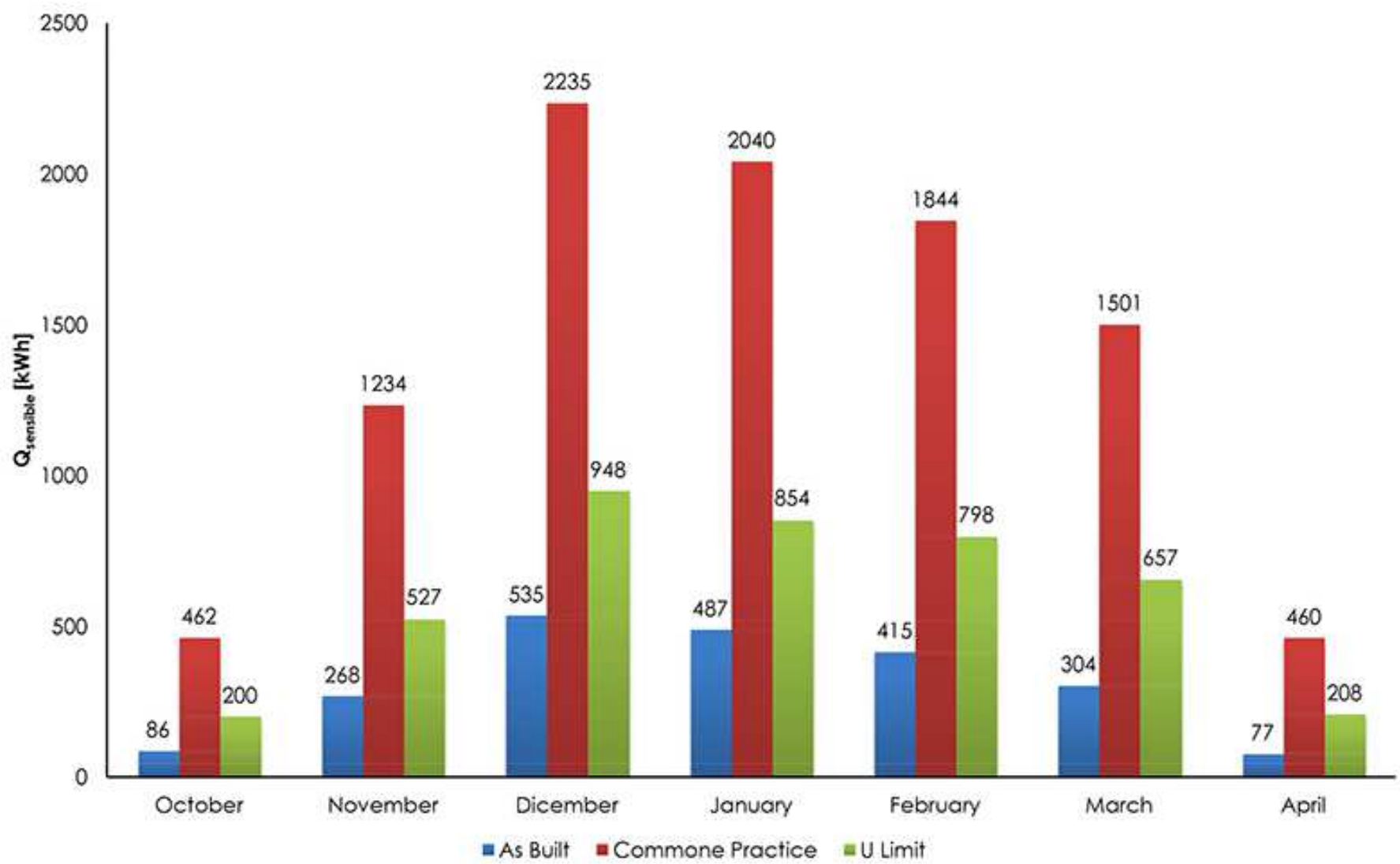


Valutazione energetica dell'edificio mediante simulazioni energetiche in regime dinamico svolte con il software **TRNSYS**.

Fabbisogno energetico senza apporti energetici da fonti rinnovabili

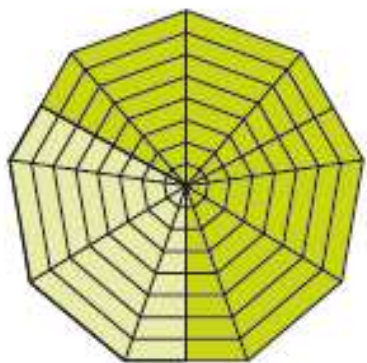


Fabbisogno energetico mensile _ VeluxLAB Campagna sperimentale inverno 2013





AMBIENTE



VELUXlab: Cantiere

Riuso dell' edificio



Bilbao 2007



Roma 2008



Milano, Rho Fiera, 2009



Politecnico di Milano, Campus Bovisa, 2011



1° Agosto 2011, h 6:00
Politecnico di Milano, Campus Bovisa



VeluxLAB: inizio del cantiere



4 mesi di lavoro:
Più di 20.000 viti, 100 m³ di isolamento

Materiali



Pannelli isolanti in fibra di legno



Pannelli isolanti in lana di roccia



Sistema isolante composto in poliuretano

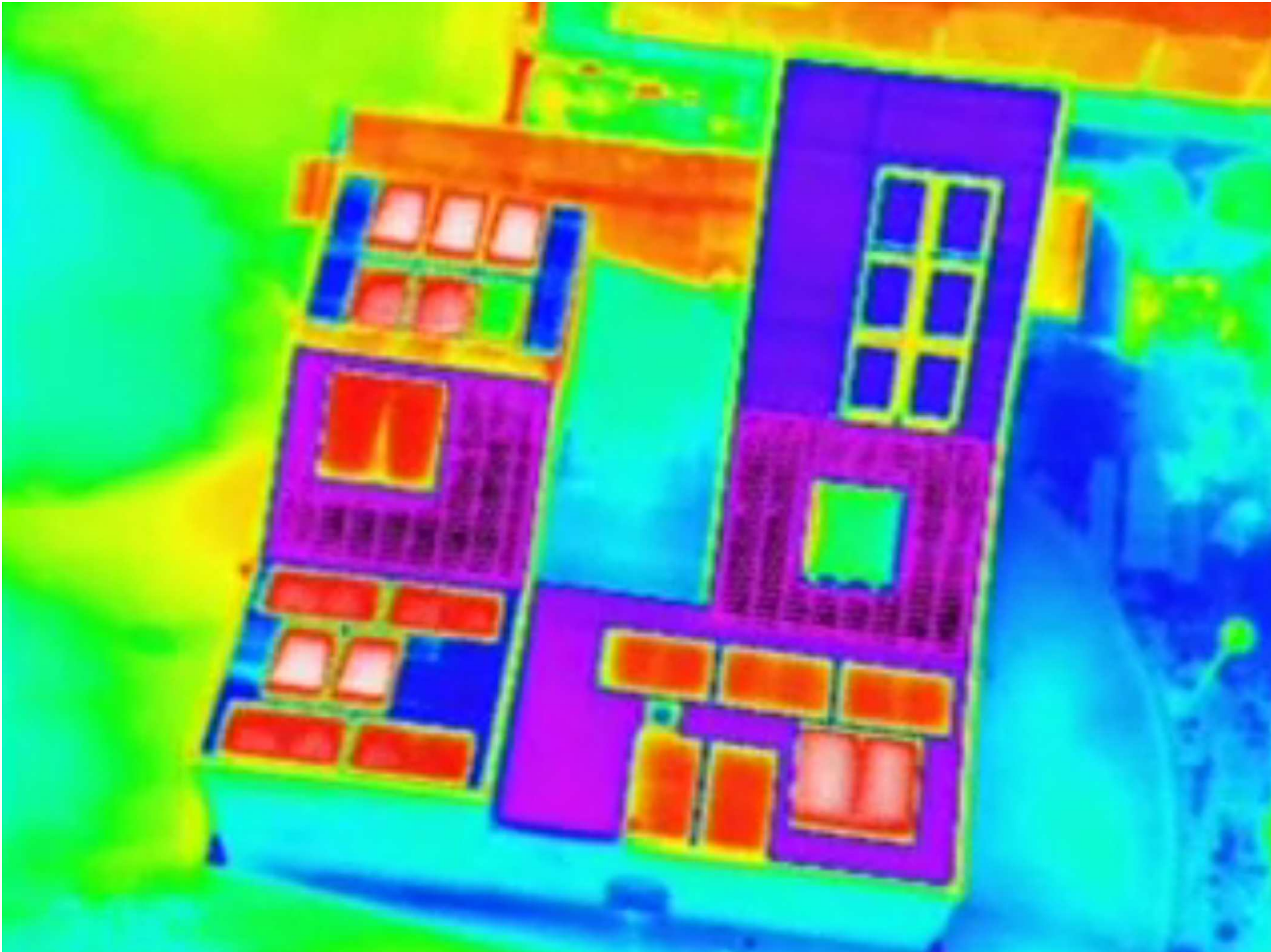


Polistirene sbriciolato



Pannelli in OSB

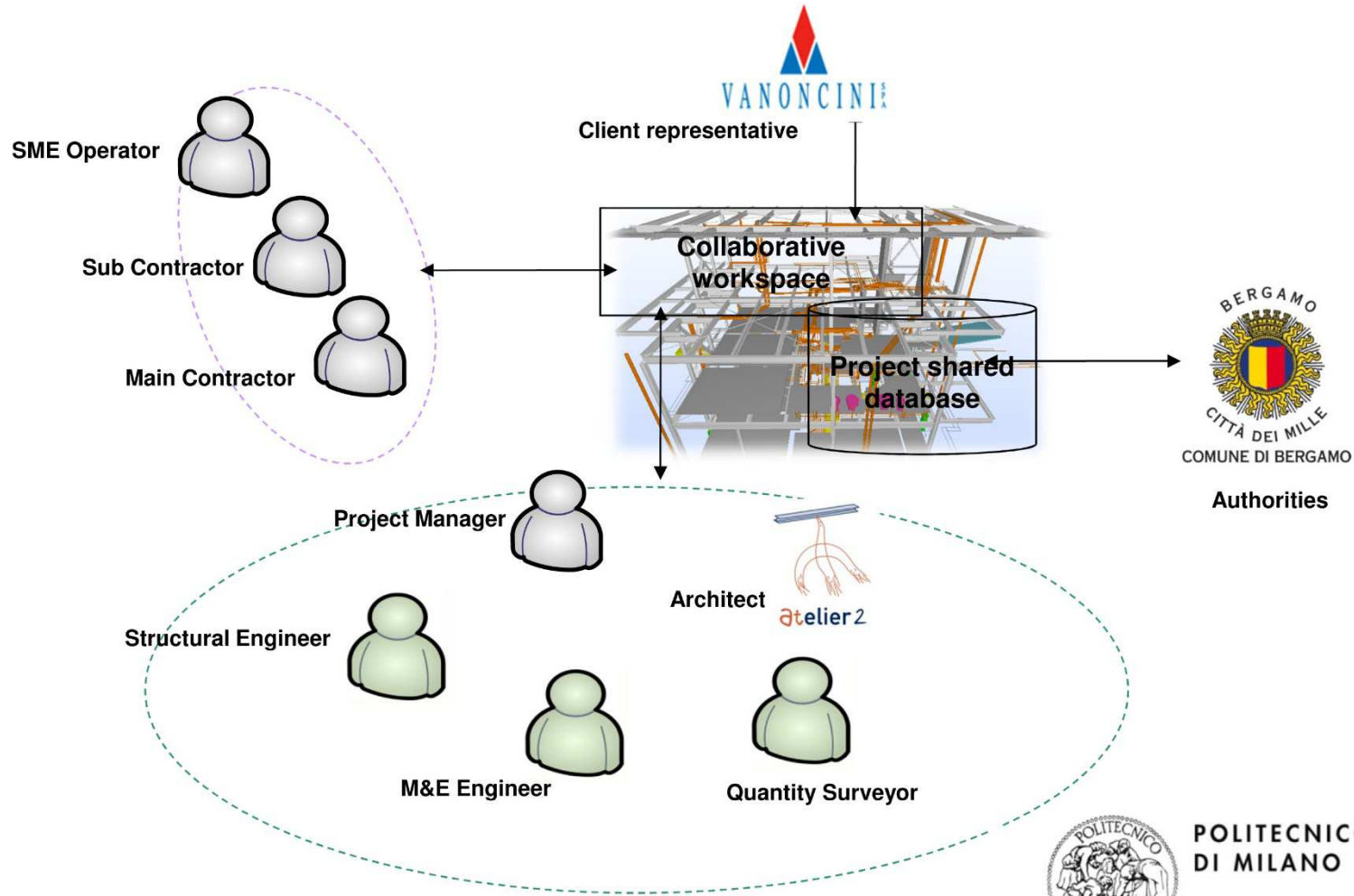




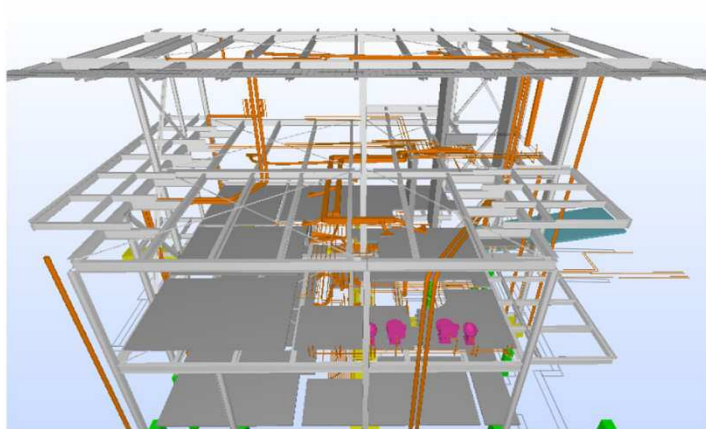


Prima Active House a Bergamo – Maison Verte – Vanoncini S.p.a.





BIM Design
 Ing. Arch. Andrea Vanossi,
 Elia Canclini
 Stefano Perossi
 Alessandro Regazzoni



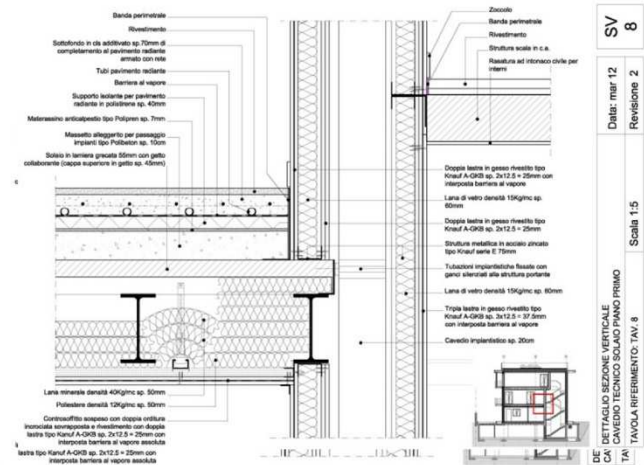
Modello integrato



Integrazione strutture impianti

Nodi richiesti 40

Produzione automatica di **dettagli integrati** tra le discipline architettonica, strutturale e impiantistica
Collegamento al modello di informazioni su materiali e schede tecniche



Dettagli costruttivi

GUIDA ALL'INSTALLAZIONE

CONSIGLI - RACCOMANDAZIONI

Precauzioni da rispettare

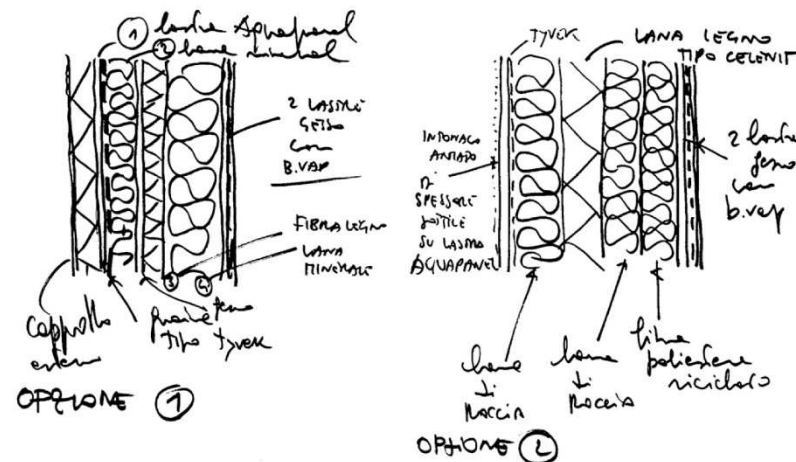
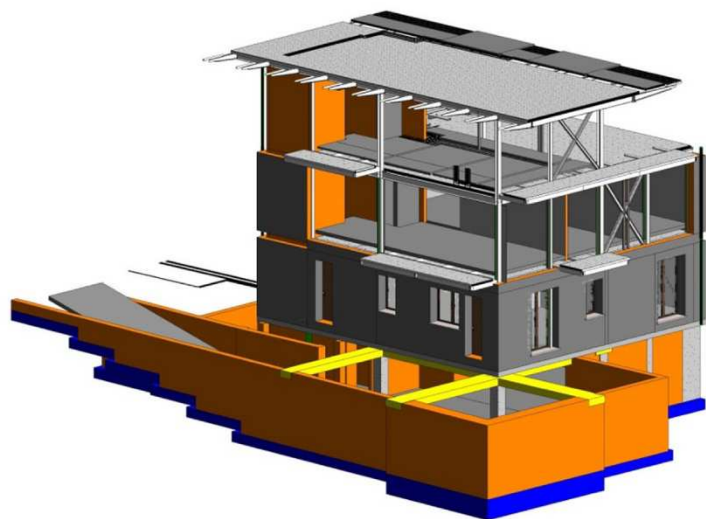
- Tipi di espansione:** ...
- Precauzioni per le intonaci:** ...
- Precauzioni per le pareti:** ...
- Precauzioni per il soffitto:** ...

AVVERTENZE: ...

ACTIS S.p.A.
Via ...
Tel. ...

Schede tecniche collegate al modello

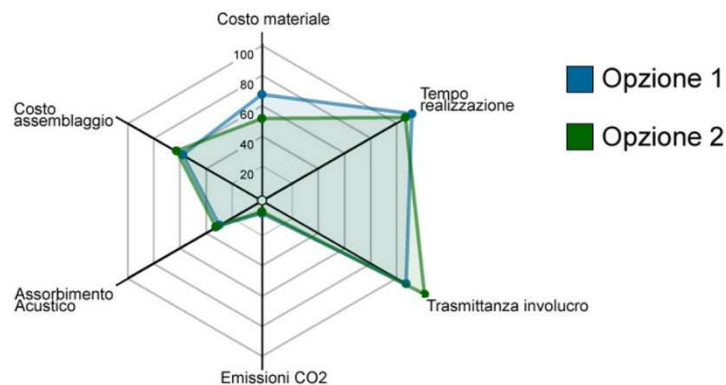




Diverse opzioni stratigrafiche dell'involucro

Il calcolo automatico delle quantità, dei costi e delle performance degli oggetti BIM permette la veloce valutazione di diverse opzioni nella scelta di materiali e stratigrafie al fine di individuarle quella reputata la "migliore" in funzione del peso assegnato ai criteri scelti.

Livello di riferimento	Tipo	Nome	URL	Costo	Prezzo	Parametri materiali				Giorno di installazione	Durata vita utile	Termi
						Lunghezza	Altezza	Area	Volume			
02_Modelo St Anna_Piano terra	CV_2	Celent_lana di legno_sp.35 240x60	C:\pr	5,00	240							0,07
02_Modelo St Anna_Piano terra	CV_2	Gesso rivestito KnauF_sp.12.5	C:\pr	5,00								0,2
02_Modelo St Anna_Piano terra	CV_2	Gesso rivestito KnauF_sp.15	C:\pr	5,00								0,2
02_Modelo St Anna_Piano terra	CV_2	Lastre KnauF Aquapanel Outdoor + Tivek	C:\pr	5,00	1200							0,35
02_Modelo St Anna_Piano terra	CV_2	Rockwool_lana di roccia_sp.60	C:\pr	5,00	1200							0,036
02_Modelo St Anna_Piano terra	CV_2	Rockwool_lana di roccia_sp.80	C:\pr	5,00	1200							0,036
02_Modelo St Anna_Piano terra	CV_2	Rofix eps-f031 TAKE-IT sp.40	C:\pr	5,00	1000							0,031
02_Modelo St Anna_Piano terra	CV_2	Sintherm_fibra di poliestere	C:\pr	5,00								0,036
02_Modelo St Anna_Piano terra	CV_2	Tyvek	C:\pr	5,00	75000			0,00 m³				
02_Modelo St Anna_Piano terra	CV_2	isolante morbido poliestere	Sintherm_fibra di poliestere	C:\pr	5,00							0,036
02_Modelo St Anna_Piano terra	CV_2	KnauF + 2 Poliestere	Gesso rivestito KnauF_sp.12.5	C:\pr	5,00	2,44 m²	0,03 m³					0,2
02_Modelo St Anna_Piano terra	CV_2	KnauF + 2 Poliestere	Sintherm_fibra di poliestere	C:\pr	5,00	2,44 m²	0,10 m³					0,036
02_Modelo St Anna_Piano terra	CV_2	KnauF + 2 Poliestere	Tyvek	C:\pr	5,00	75000	1,22 m²	0,00 m³				
02_Modelo St Anna_Piano terra	CV_2	doppia lastra KnauF	Gesso rivestito KnauF_sp.12.5	C:\pr	5,00							0,2
02_Modelo St Anna_Piano terra	CV_2	isolanti morbidi	Rockwool_lana di roccia_sp.80	C:\pr	5,00	1200	0,75 m²	0,06 m³				0,036
02_Modelo St Anna_Piano terra	CV_2	isolanti morbidi	Sintherm_fibra di poliestere	C:\pr	5,00		0,75 m²	0,03 m³				0,036
02_Modelo St Anna_Piano terra	CV_2	lato esterno da celent	Celent_lana di legno_sp.35 240x60	C:\pr	5,00	240	1,22 m²	0,05 m³				0,07
02_Modelo St Anna_Piano terra	CV_2	lato esterno da celent	Gesso rivestito KnauF_sp.15	C:\pr	5,00		1,22 m²	0,02 m³				0,2
02_Modelo St Anna_Piano terra	CV_2	lato esterno da celent	Lastre KnauF Aquapanel Outdoor + Tivek	C:\pr	5,00	1200	1,22 m²	0,02 m³				0,35
02_Modelo St Anna_Piano terra	CV_2	lato esterno da celent	Rockwool_lana di roccia_sp.60	C:\pr	5,00	1200	1,22 m²	0,07 m³				0,036
02_Modelo St Anna_Piano terra	CV_2	lato esterno da celent	Rofix eps-f031 TAKE-IT sp.40	C:\pr	5,00	1000	1,22 m²	0,05 m³				0,031
02_Modelo St Anna_Piano terra	CV_2	lato esterno da celent	Tyvek	C:\pr	5,00	75000	1,22 m²	0,00 m³				



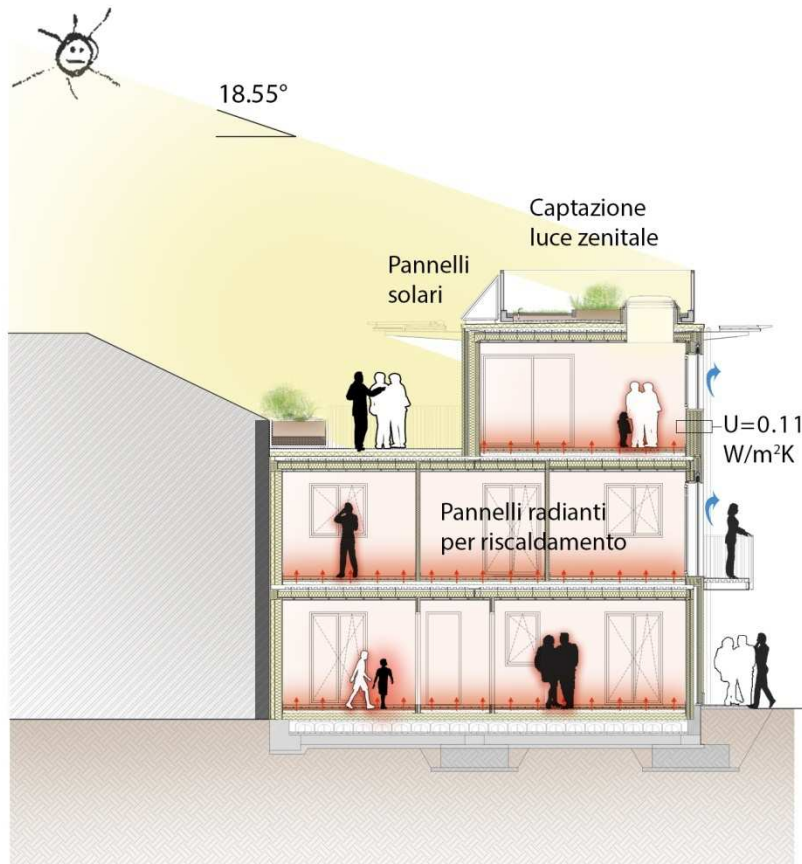


Schema energetico

SCHEMATIC DESIGN

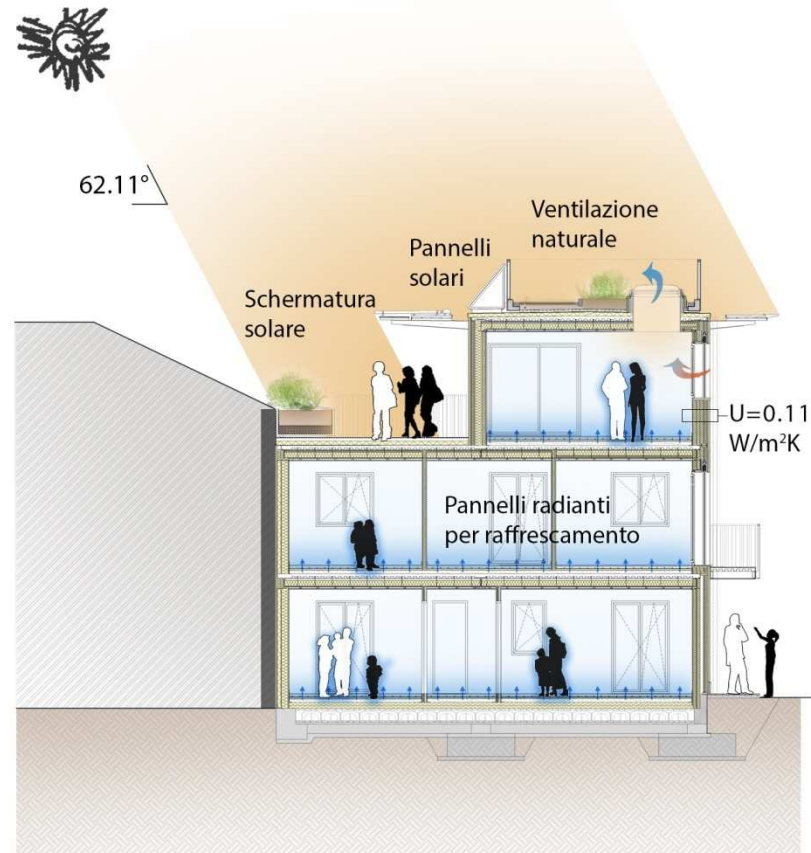
Strategie energetiche invernali

- Iperisolamento con strati differenziati di isolante nelle chiusure opache
- Termotrasmittanza chiusure opache $0.11 \text{ W/m}^2\text{K}$
- Pannelli radianti a pavimento per riscaldamento
- Captazione luce zenitale
- Pannelli solari termici
- Tetto giardino



Strategie energetiche estive

- Inerzia termica delle chiusure opache
- Termotrasmittanza chiusure opache $0.11 \text{ W/m}^2\text{K}$
- Pannelli radianti a pavimento per raffrescamento
- Ventilazione naturale/VMC
- Pannelli solari termici
- Schermatura della radiazione solare
- Tetto giardino



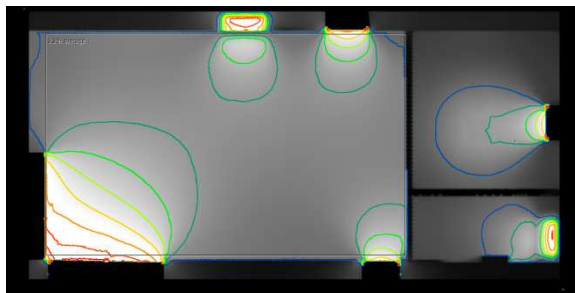
Analisi illuminotecniche

Fattore medio di luce diurna.

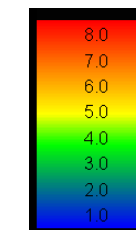
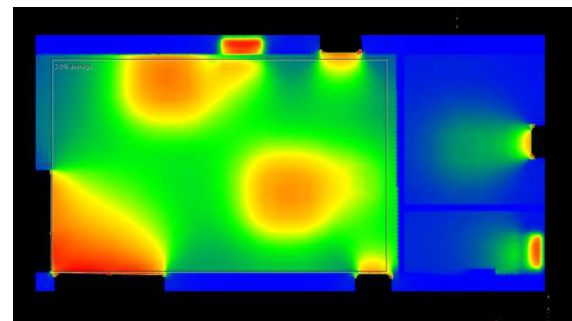
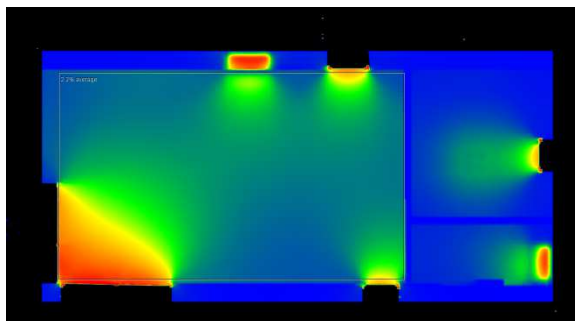
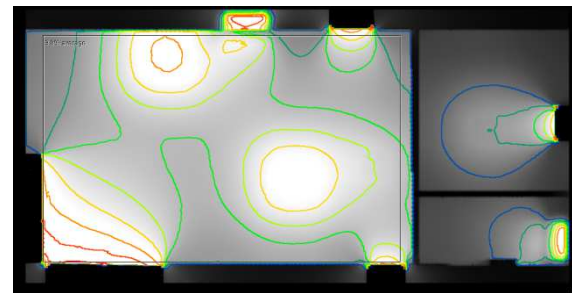
Nella situazione con i cupolini (a sinistra), la luce zenitale assicura alti valori di FLD con una distribuzione omogenea della luce rispetto alla situazione senza cupolini (a destra) priva di aperture zenitali.



FLDm= 2,2% situazione senza cupolini



FLDm= 3,8% situazione con cupolini

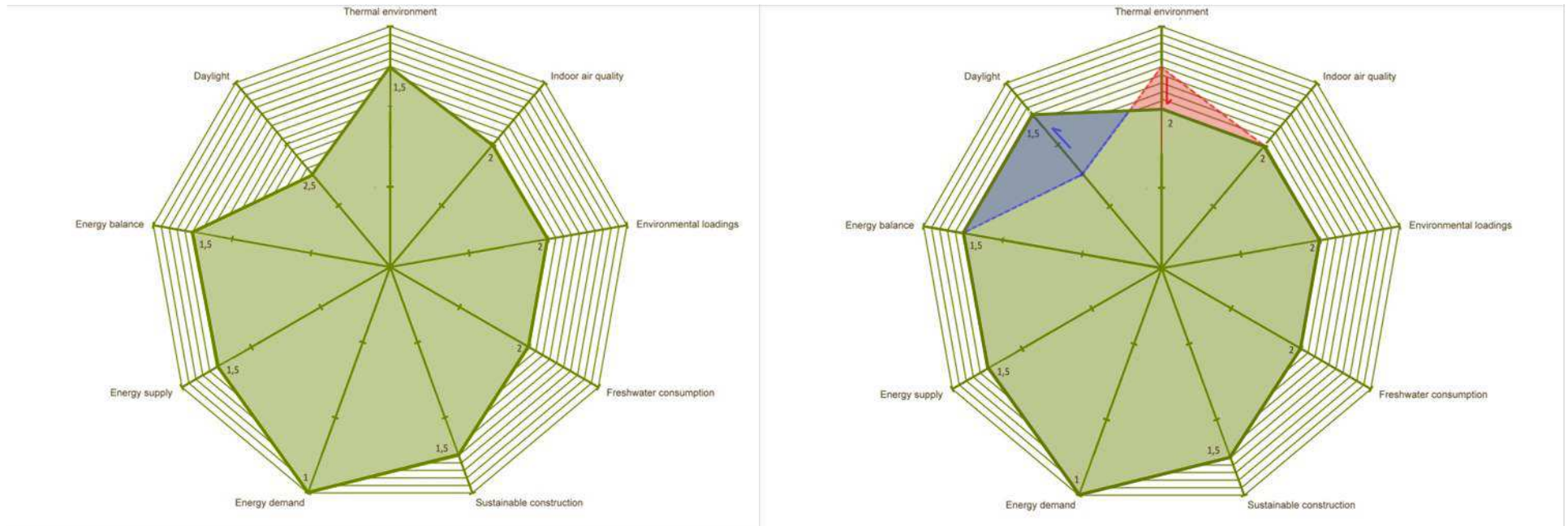




Validazione Active House

Situazione senza cupolini
Parametro Daylight= 2,5

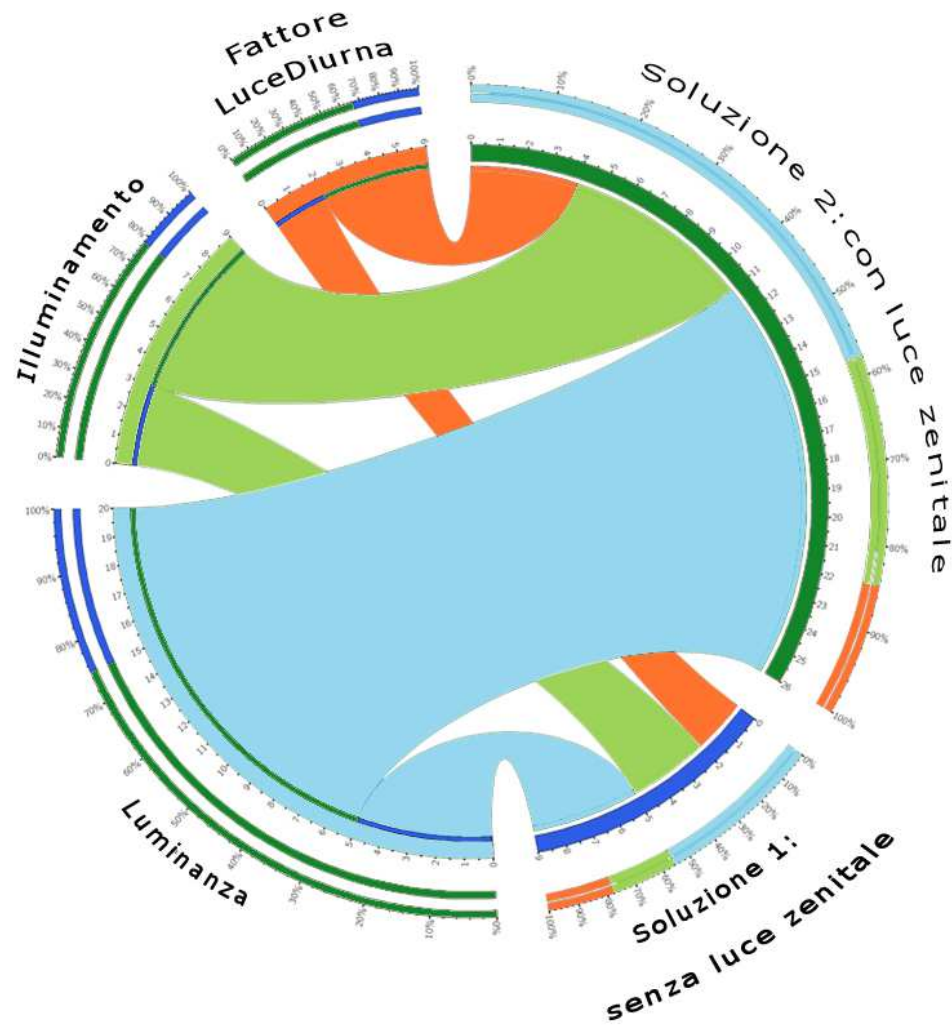
Situazione con cupolini
Parametro Daylight= 1,4



Dati Radar di progetto.

Radar Active House realizzato in fase progettuale come strumento per l'ottimizzazione e l'individuazione delle criticità. Variazione del parametro di Daylight nella situazione senza aperture zenitali (sinistra) rispetto alla soluzione con i cupolini (destra)

Analisi comfort interno



DATA	SOL1	SOL2
FLD	2.2	3.8
ILLUMINAMEN TO	255.2	689.3
LUMINANZA	4.6	15.4

Analisi della differente incidenza dei parametri di comfort luminoso (FLD, Illuminamento, Luminanza) nella situazione senza aperture zenitali (SOL1) rispetto alla soluzione con i cupolini (SOL2)



mon portrait fait par
mon mème
Donizetti
1829

*"Ah, se potessi avere una veduta grande di Bergamo !
Una volta c'erano . . . La pagherei, sapete?"*

Napoli, 22 Maggio 1829

Gaetano Donizetti, lettera al padre







Si sente la necessità assoluta di muoversi.

E soprattutto di muoversi in una direzione particolare.

Una doppia necessità: muoversi e sapere in che direzione.

D.H. LAWRENCE, Mare e Sardegna

