

edilportale[®]

TOUR 2016

Efficienza energetica e comfort abitativo
Tecnologie non invasive e sicurezza
Sostenibilità economica e ambientale

in collaborazione con

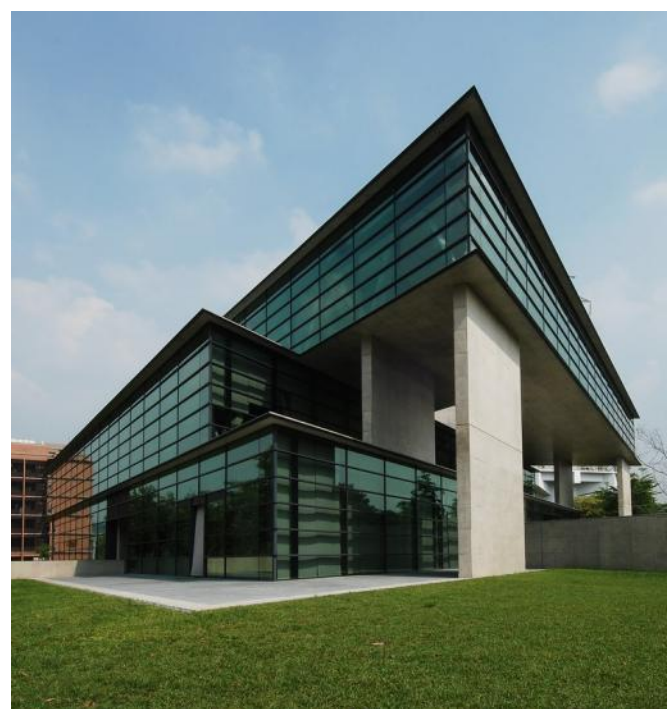


Brescia, 9 giugno 2016

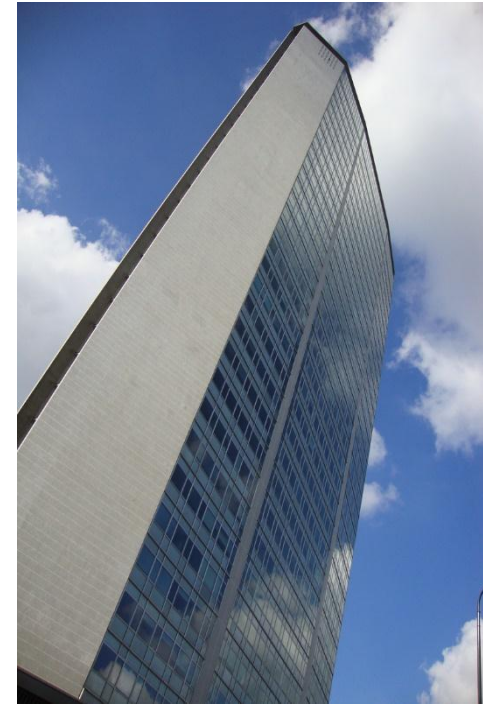
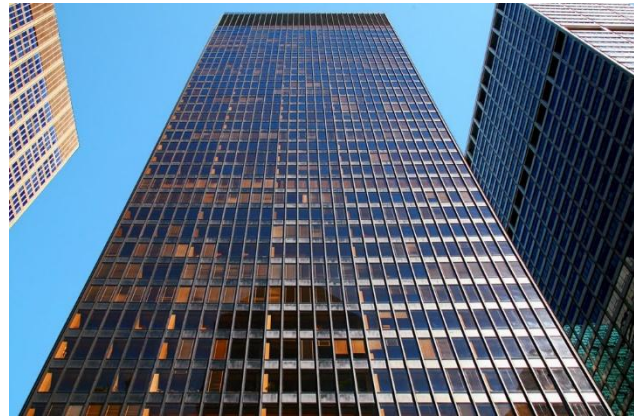
Vetro e Architettura: cambiare l'idea di finestra

Niccolò Aste

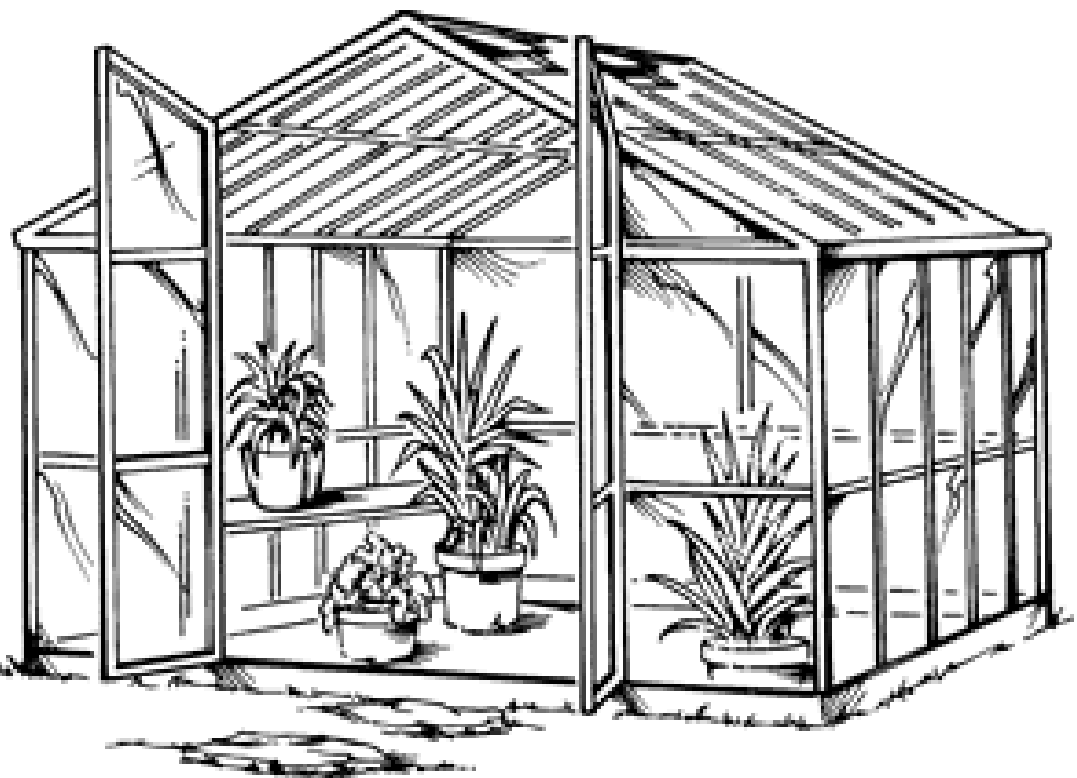
ARCHITETTURA CONTEMPORANEA...



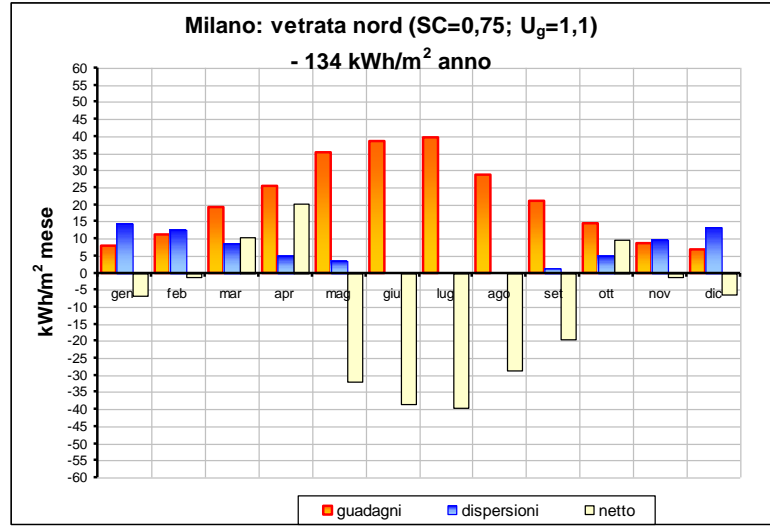
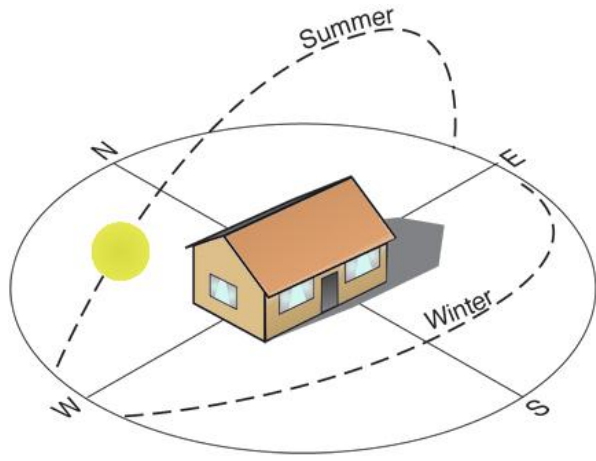
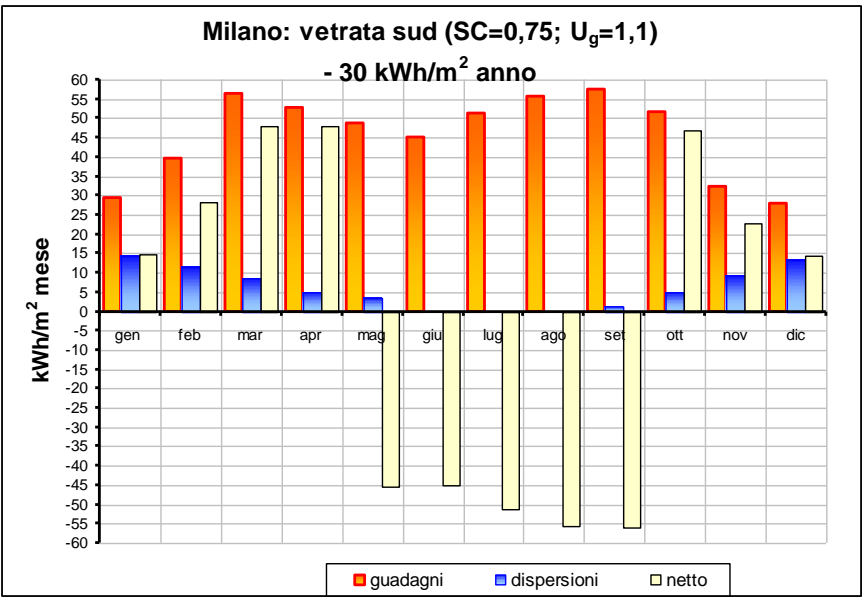
ARCHITETTURA MODERNA...



...UN CONCETTO ANTICO

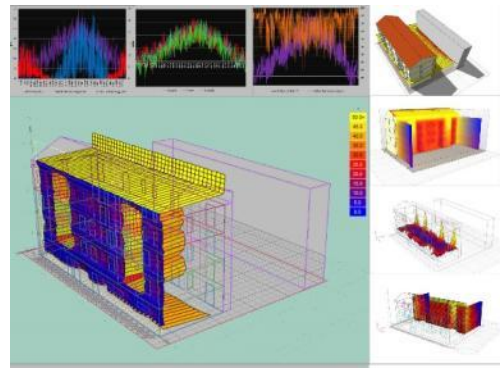
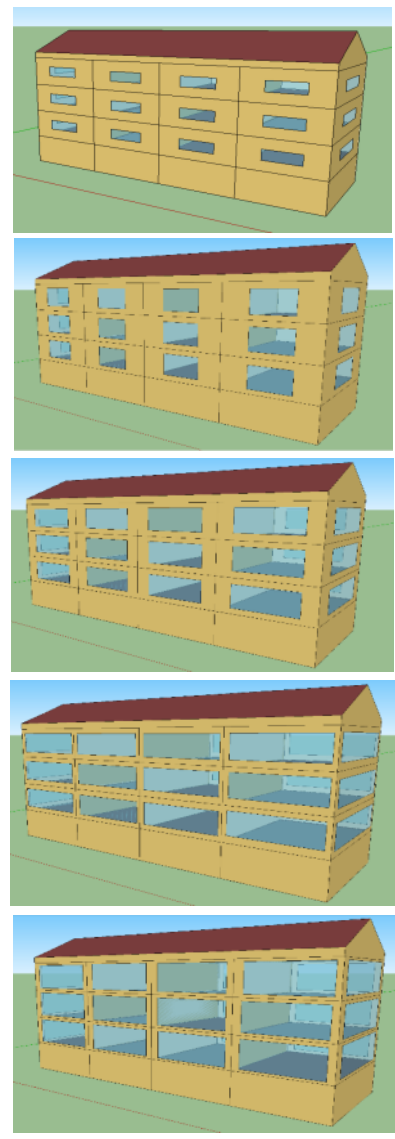
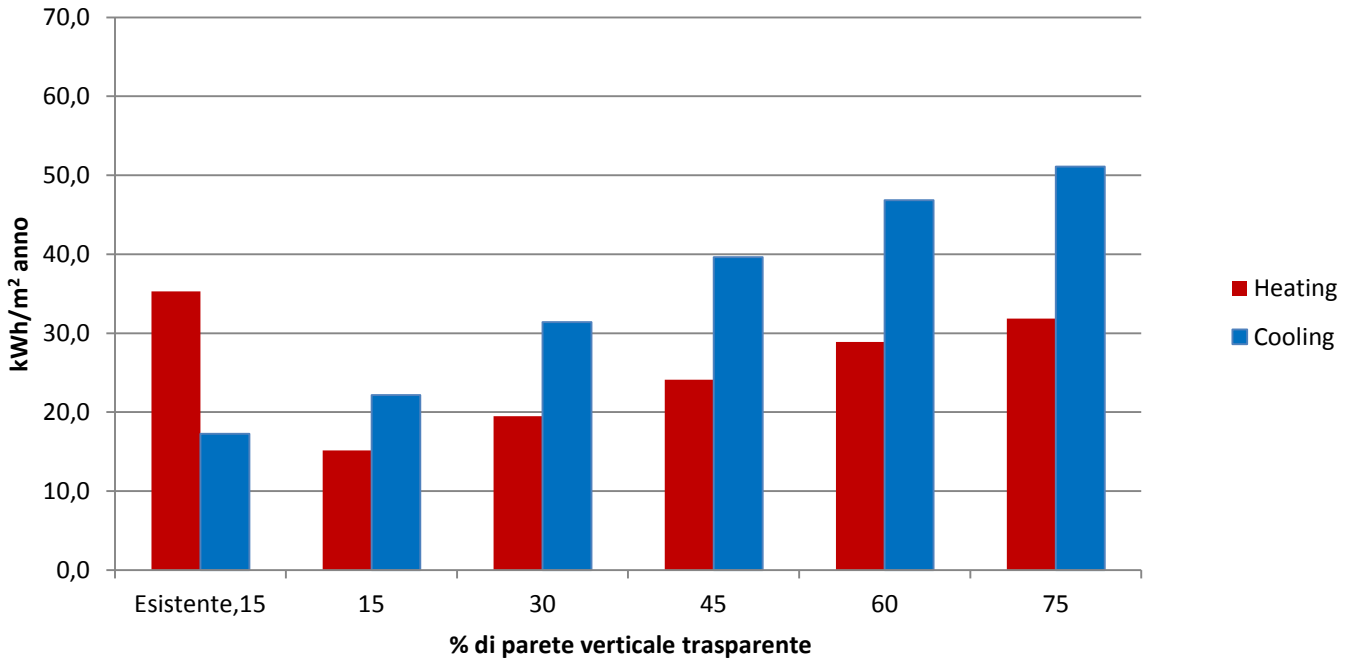


VETRO E PRESTAZIONE ENERGETICA (1)

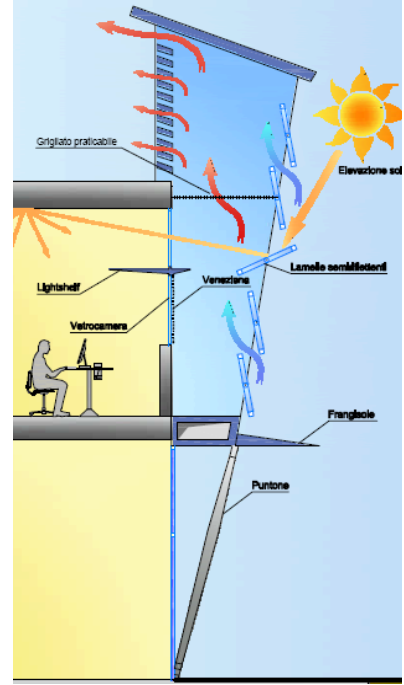
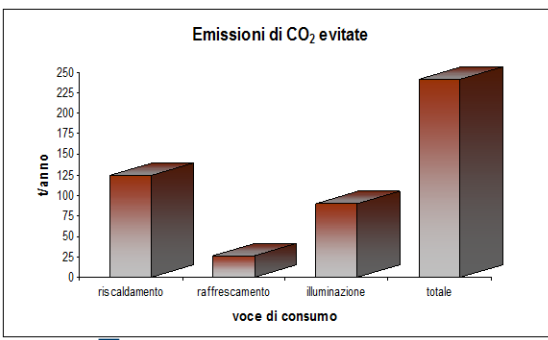
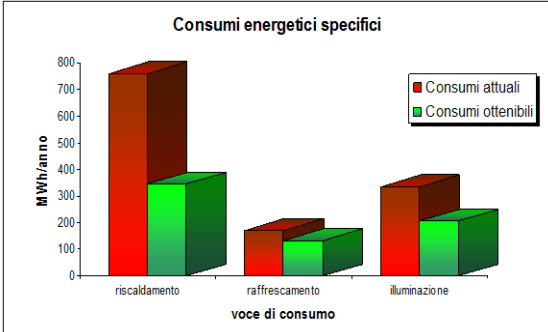
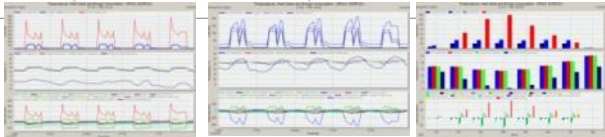
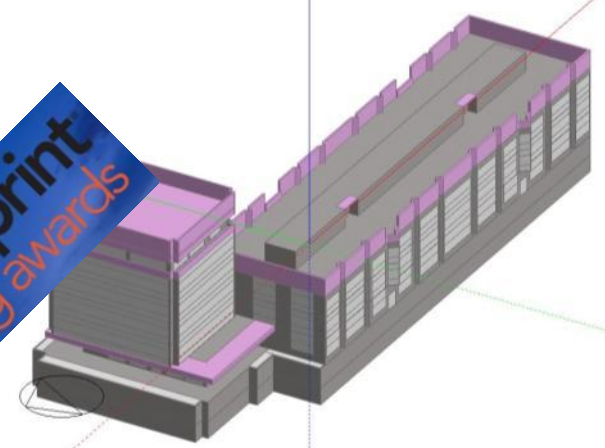


VETRO E PRESTAZIONE ENERGETICA (2)

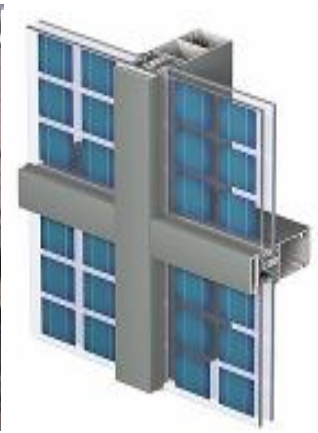
Fabbisogno utile al variare della superficie vetrata



ENERGY RETROFIT: ERGO BUILDING



VETRO E FOTOVOLTAICO



SMART WINDOWS

nature
THE INTERNATIONAL WEEKLY JOURNAL OF SCIENCE

Windows upgrade

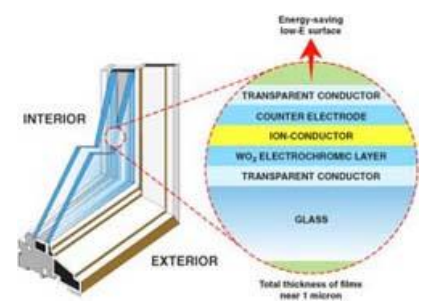
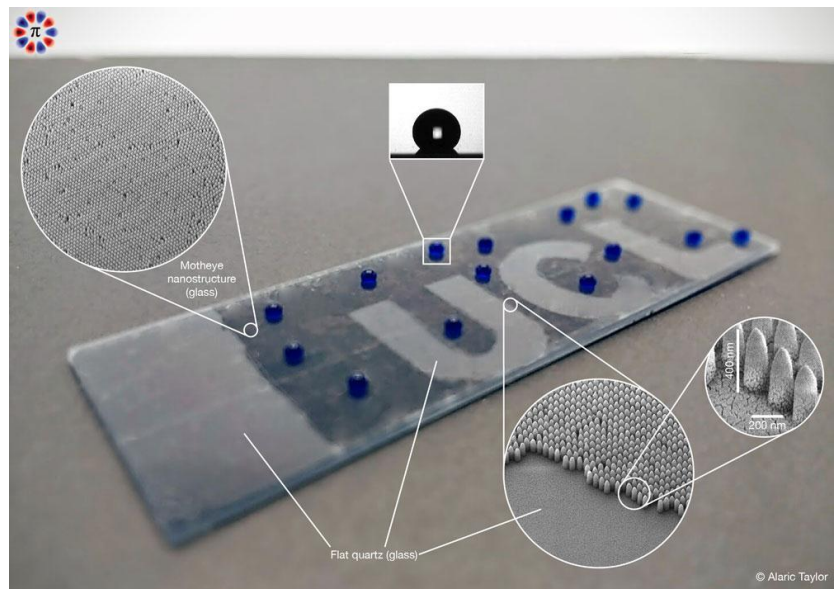
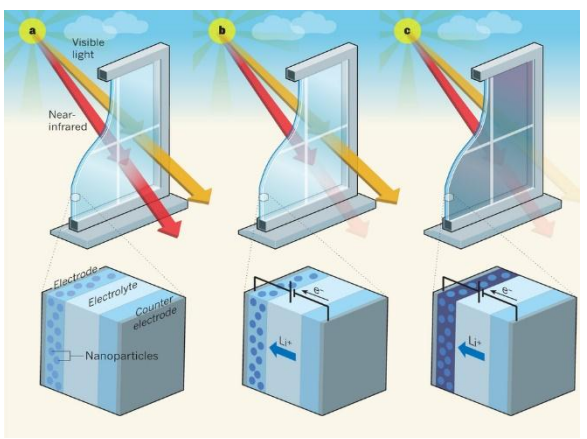
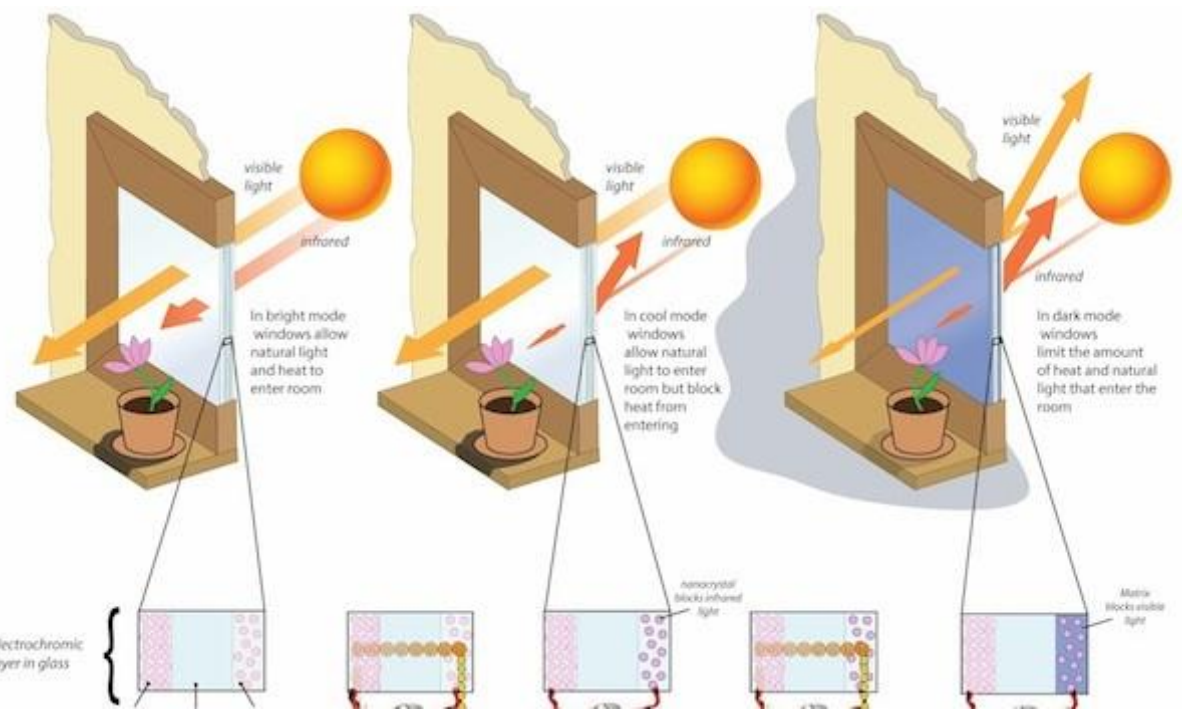
Smart nanocrystal-in-glass composites regulate light and heat transmission
PAGES 270 & 273

PSYCHOLOGY
UNRELIABLE EVIDENCE
The vagaries of eyewitness testimony
PAGE 256

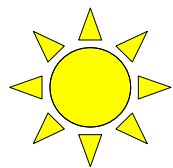
ECOLOGY
CARBON SINKS FEEL THE HEAT
Climate extremes could raise atmospheric CO₂
PAGE 267

QUANTUM INFORMATION
BRIDGING THE GAP
Two new approaches to on-demand teleportation
PAGES 262, 315 & 319

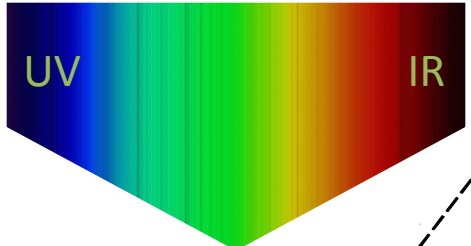
NATURE.COM/NATURE
15 SEP 2012



CONCENTRATORI SOLARI LUMINESCENTI (LSC)



RADIAZIONE SOLARE INCIDENTE



LASTRA ATTIVA

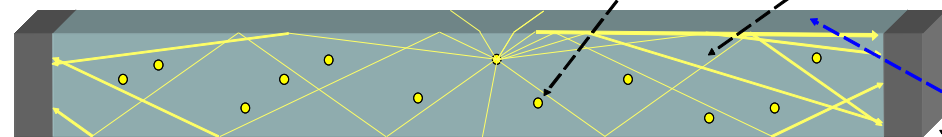
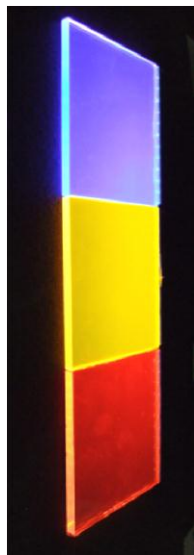
I coloranti fluorescenti sono dispersi in una matrice trasparente; essi assorbono la luce solare nel range spettrale UV-VIS e la convertono nella radiazione VIS-NIR, dove le celle fotovoltaiche hanno efficienza più elevata

GUIDA D'ONDA

La maggior parte della radiazione convertita è concentrata ai bordi della lastra per riflessione interna

CONCENTRAZIONE SULLE CELLE FOTOVOLTAICHE

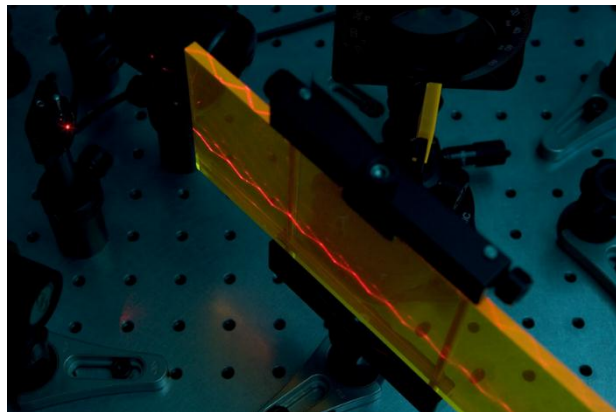
La luce assorbita sull'elevata area della lastra è concentrata su piccole celle PV poste ai bordi



RADIAZIONE TRASMESSA

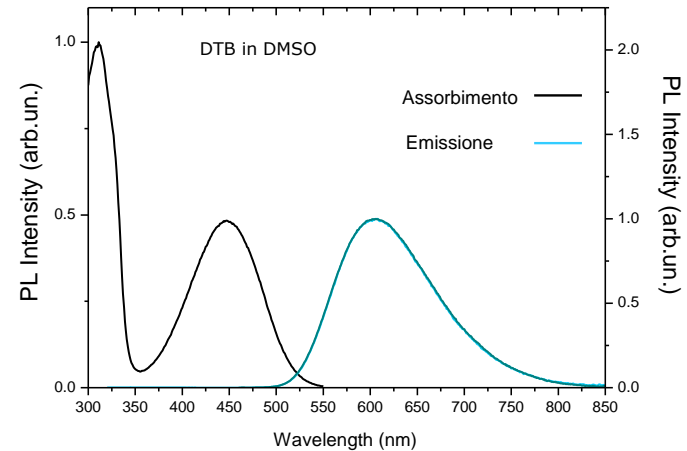


- VANTAGGI PRINCIPALI**
- ✓ moduli PV colorati e trasparenti
 - ✓ sfruttamento della luce diffusa
 - ✓ complementarità con il PV tradizionale



LA RICERCA DI ENI

- sviluppati coloranti originali estremamente promettenti in termini di prestazioni, stabilità e scale up
- progettate e testate celle solari al silicio ottimizzate per LSC
- definito processo di assemblaggio
- definita la catena del valore per la produzione su scala commerciale
- 28 domande di brevetto depositate



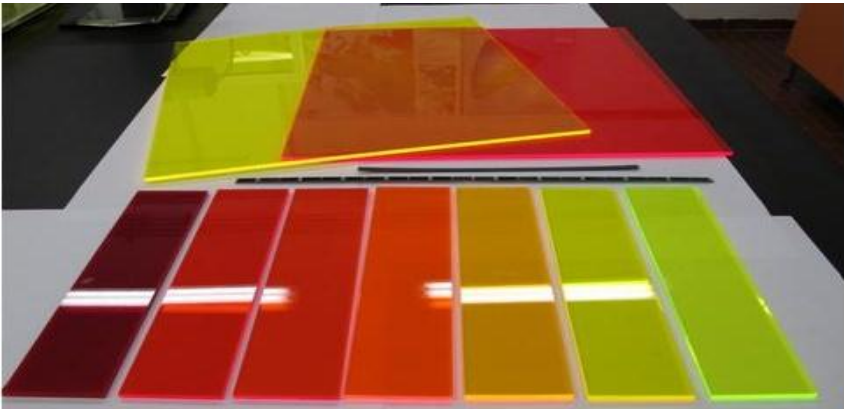
Risultati tecnici

- scala di laboratorio: efficienza fino al 6.3% per dispositivi semitrasparenti
7.4% con un pannello riflettente sul retro (record mondiale per gli LSC!)
- prove di invecchiamento accelerato (DIN EN ISO 4892-2) **in corso**
 - ✓ prestazioni stabili dopo oltre 8000 ore

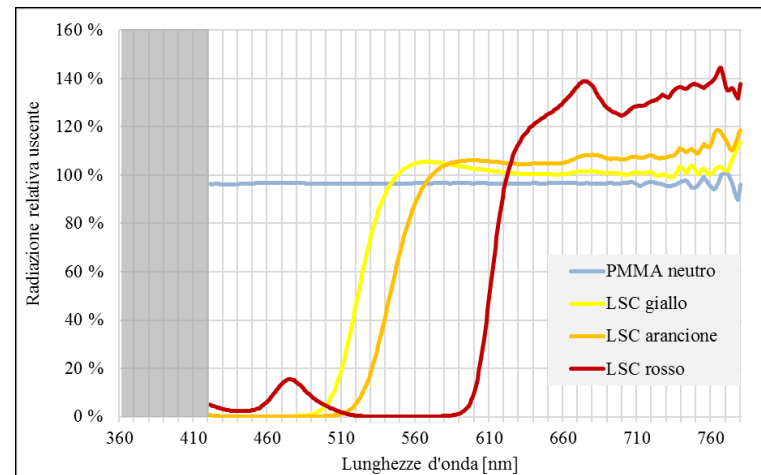
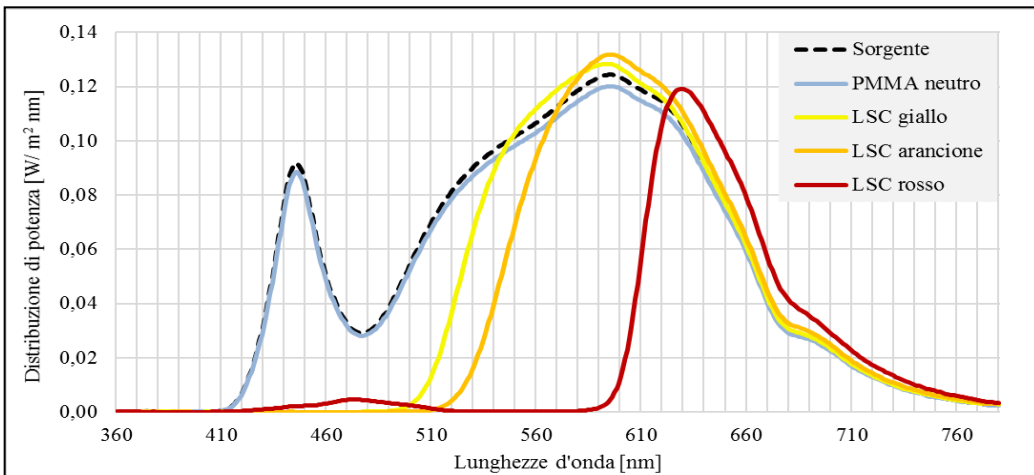
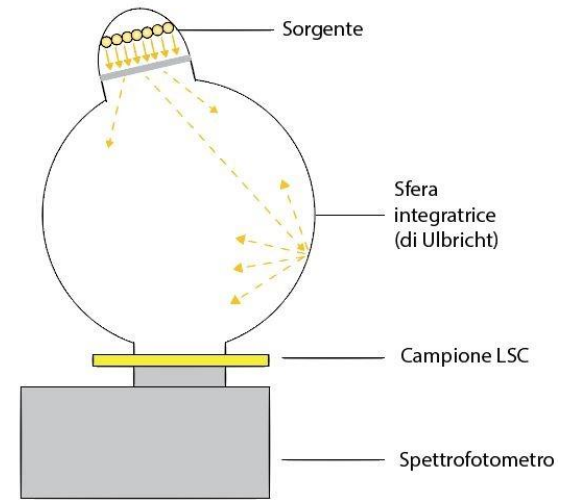
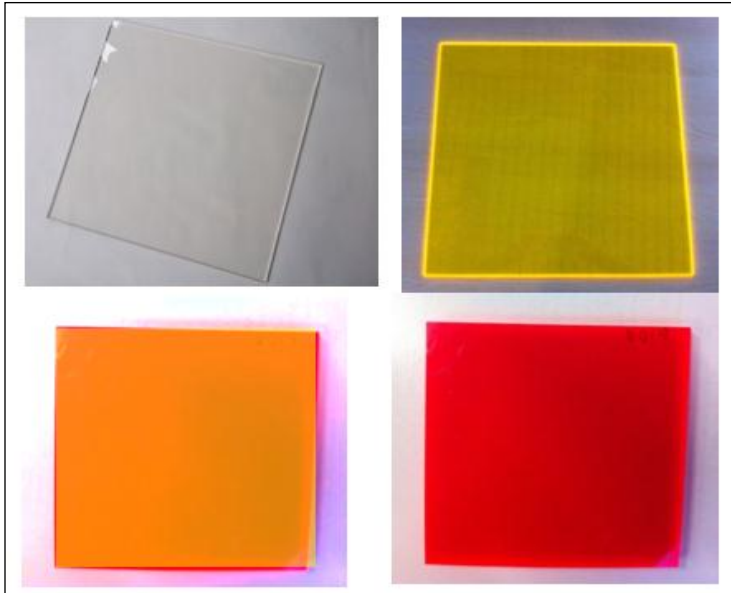
punti di forza ENI

- coloranti con basso autoassorbimento
- **coloranti a ridotto assorbimento nella regione dove è più sensibile l'occhio umano**
- know-how per lo scale-up della tecnologia
- network di fornitori e potenziali partner

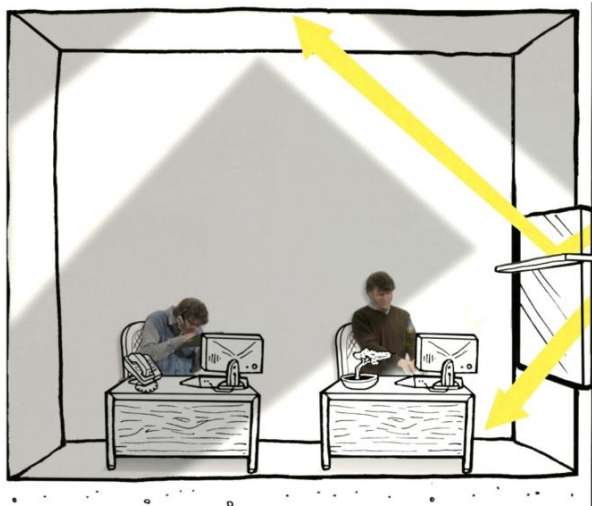
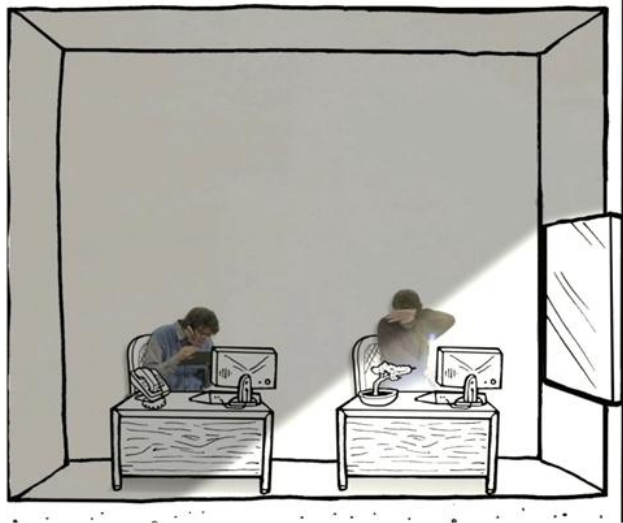
SVILUPPO BIPV-LSC, ENI – POLITECNICO DI MILANO



CARATTERIZZAZIONE ILLUMINOTECNICA

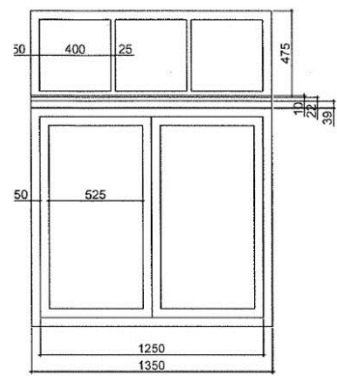
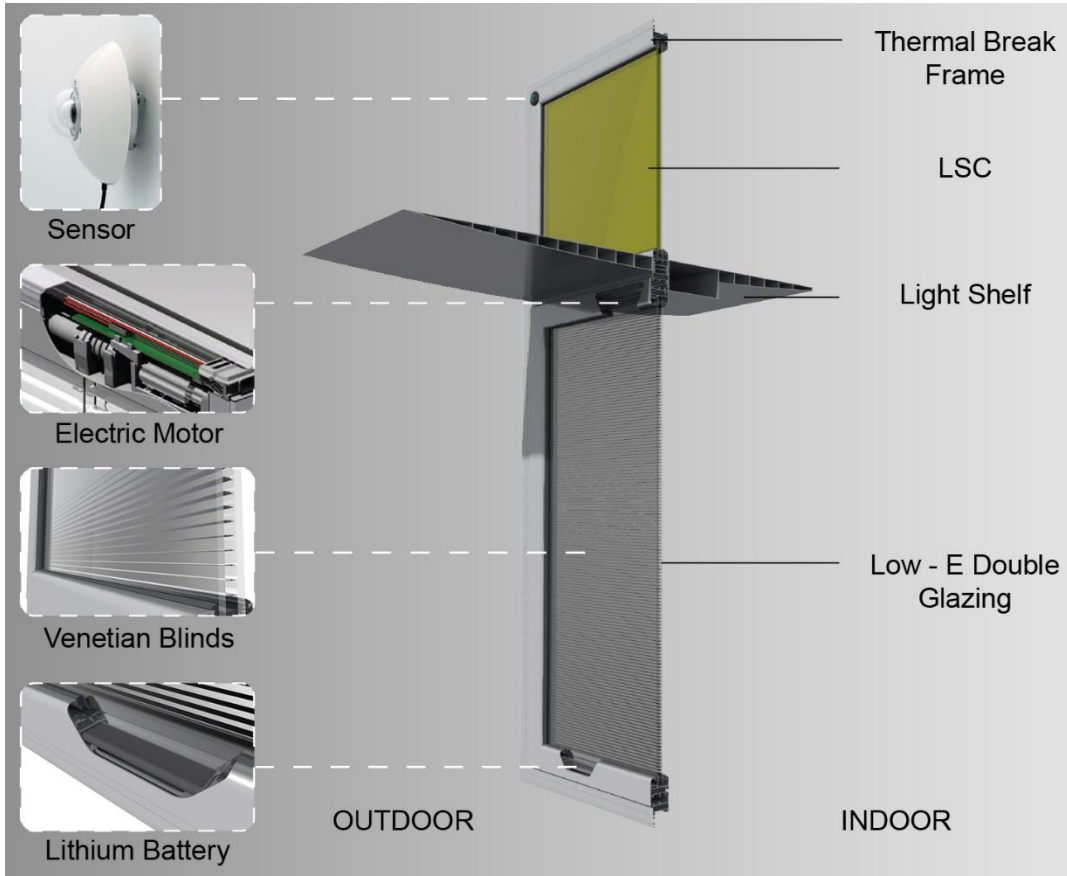


DAYLIGHTING

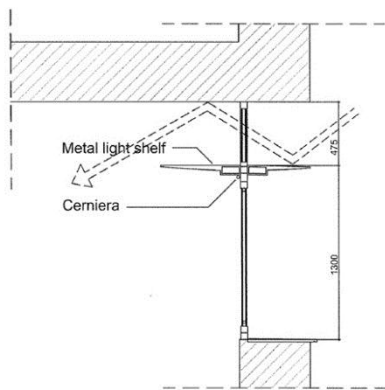
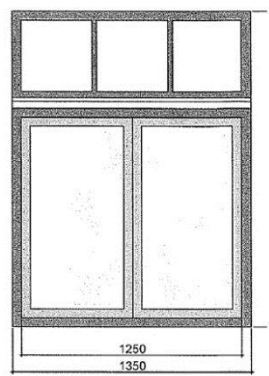


Fonte: Autodesk Sustainability Workshop

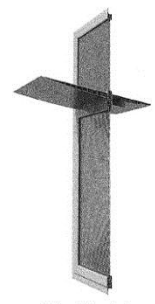
PROGETTO SWING



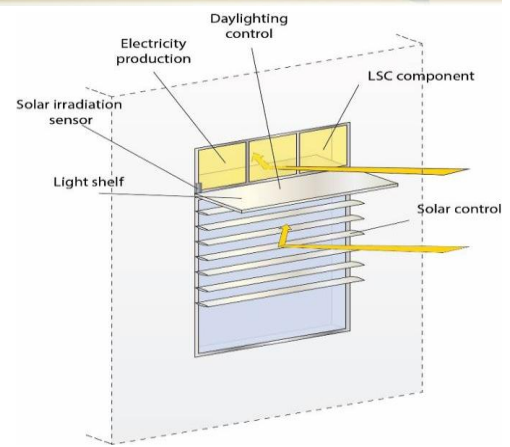
Prospetti, scala 1:20



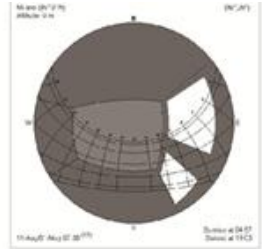
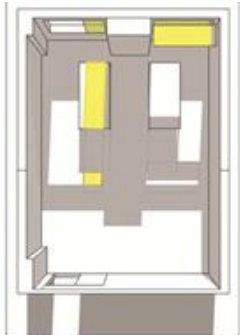
Sezione, scala 1:20



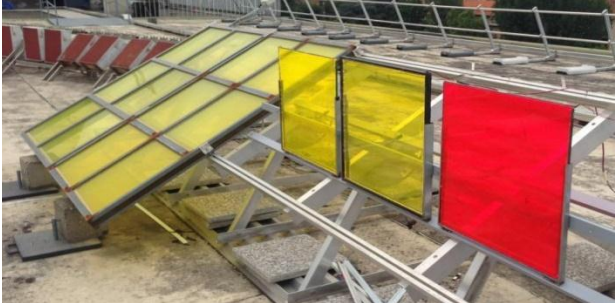
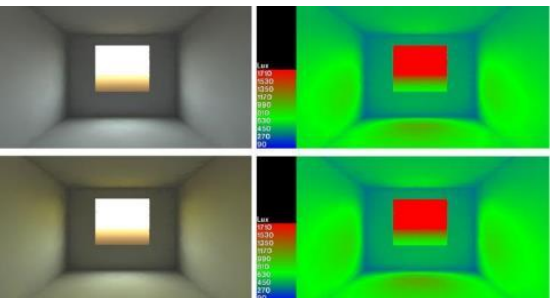
GUALINI
 Enveloppe du bâtiment.
 • Murs rideaux • Menuiseries
 • Façades ventilées • Constructions métalliques



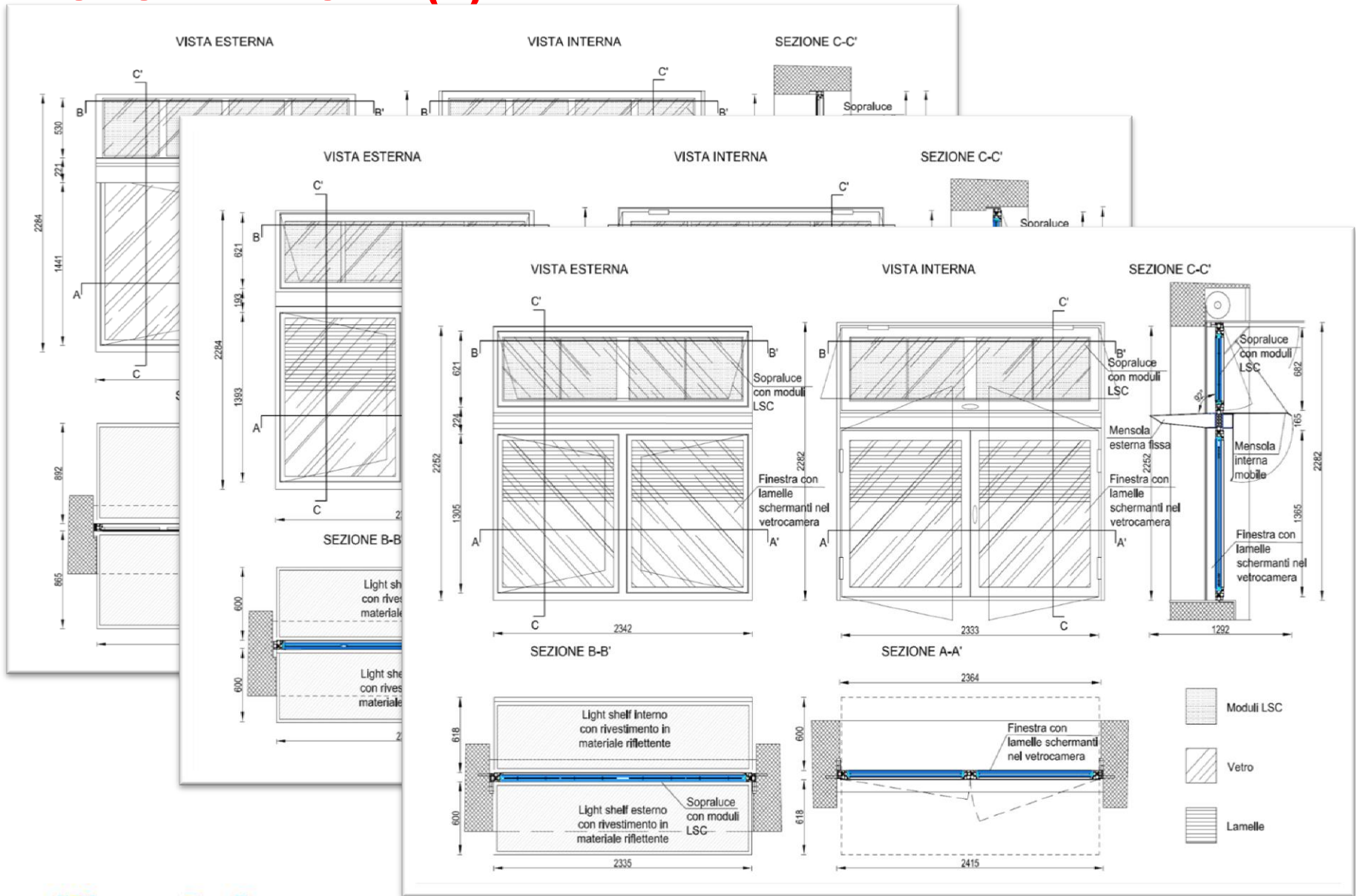
LA CAMPAGNA SPERIMENTALE (1)



21 maggio 2013, ore 9:00
1_Posizione pannello/finestra: verticale e sopra luce con light sb
2_Esposizione solare: EST
3_Situazione cielo: soleggiato



PROTOTIPAZIONE (1)



PROTOTIPAZIONE (2)



LA CAMPAGNA SPERIMENTALE (2)



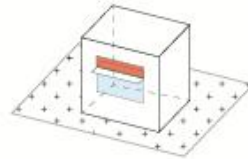
**Test room reale
(9 punti di analisi)**

- distribuzione spettrale di potenza
- illuminamento (minimo, massimo e medio)
- coordinate cromatiche
- efficienza luminosa
- temperatura di colore
- uniformità



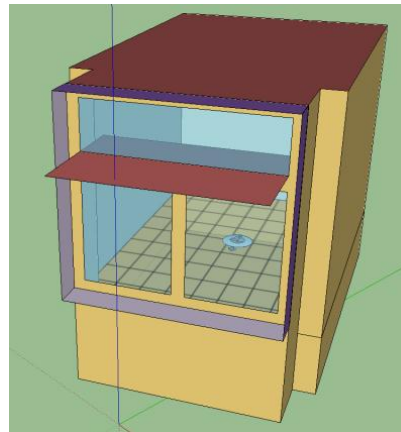
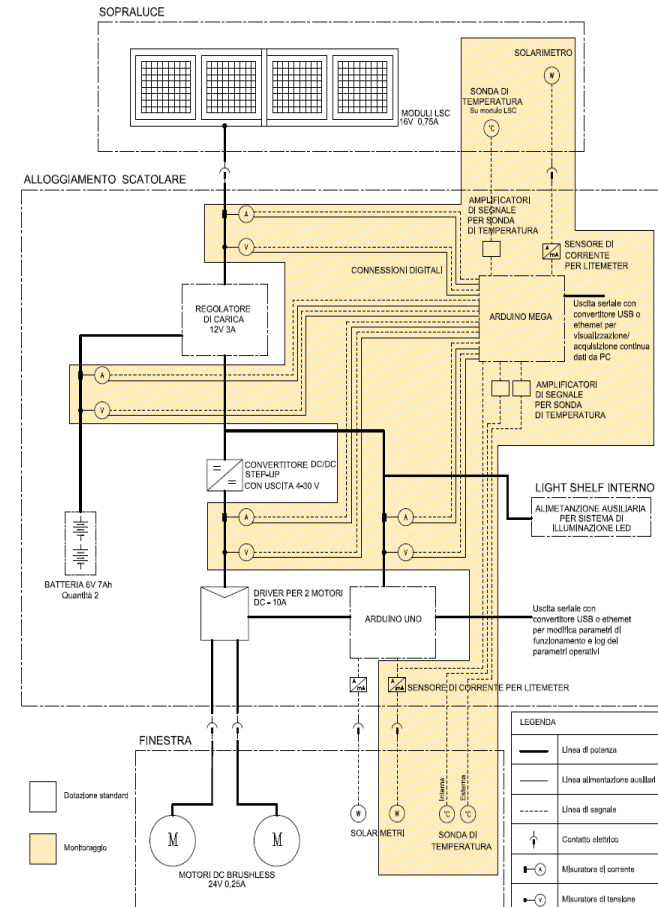
**Modello fisico della test room in scala
(1 punto di analisi)**

- illuminamento
- temperatura di colore

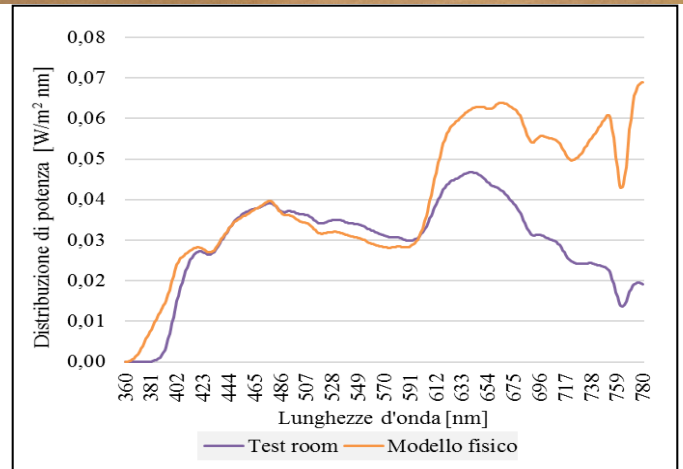


**Modello virtuale della test room
(349 punti di analisi)**

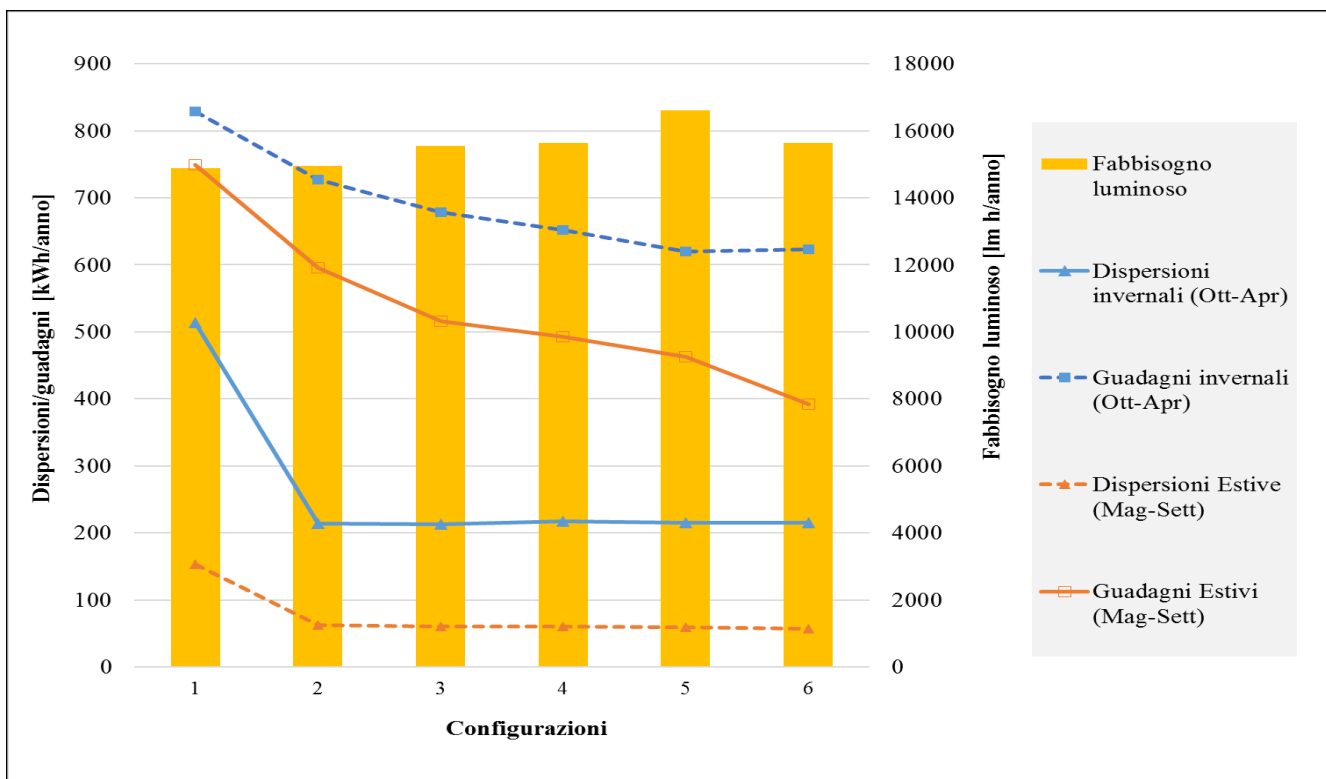
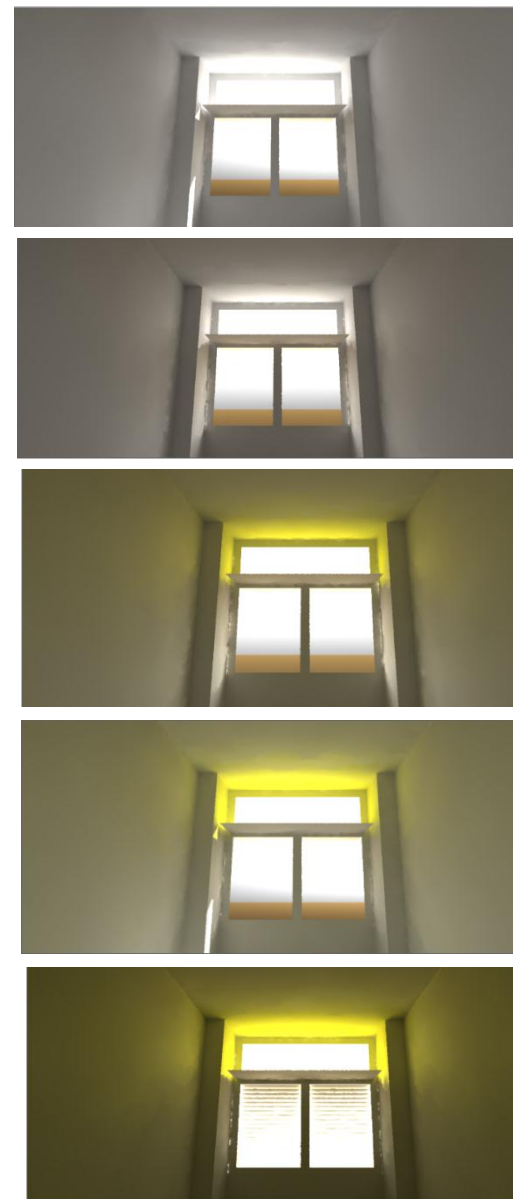
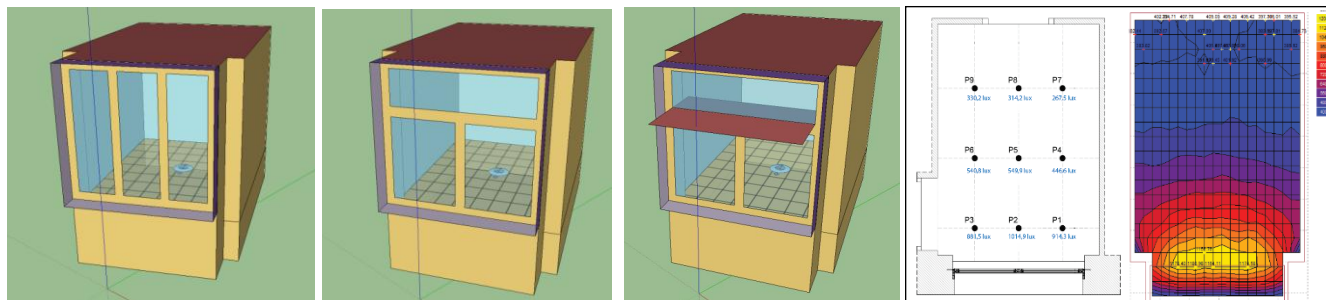
- illuminamento



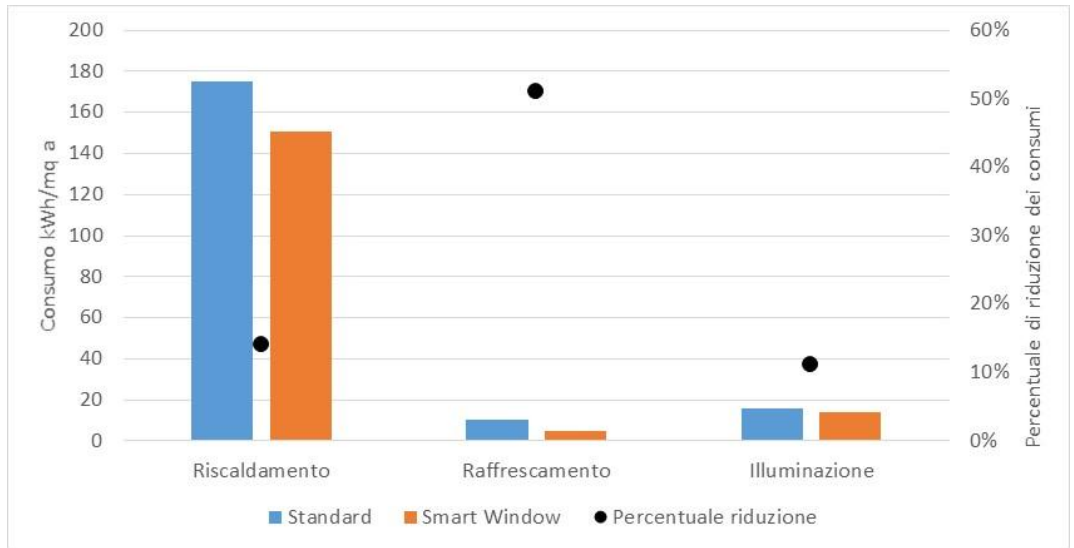
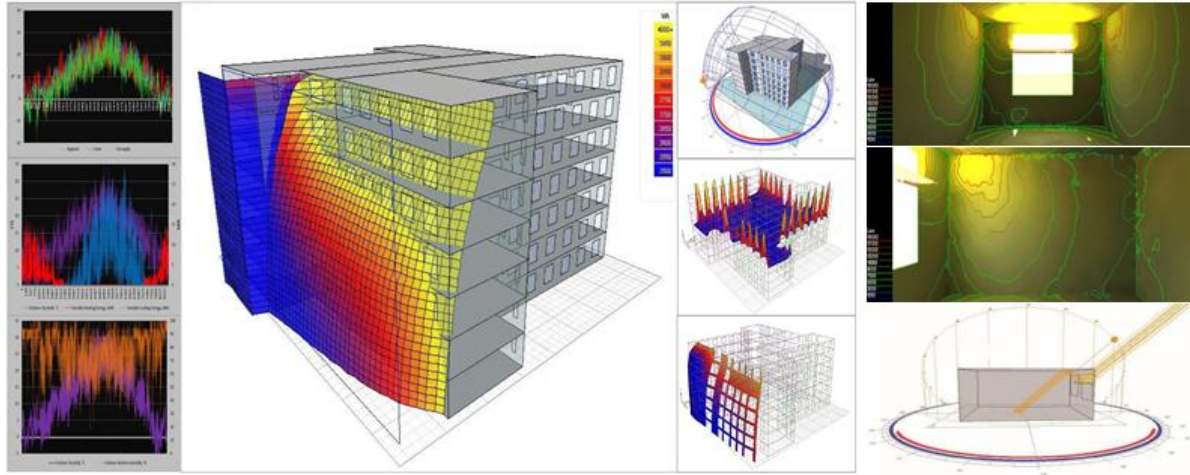
LA CAMPAGNA SPERIMENTALE (3)



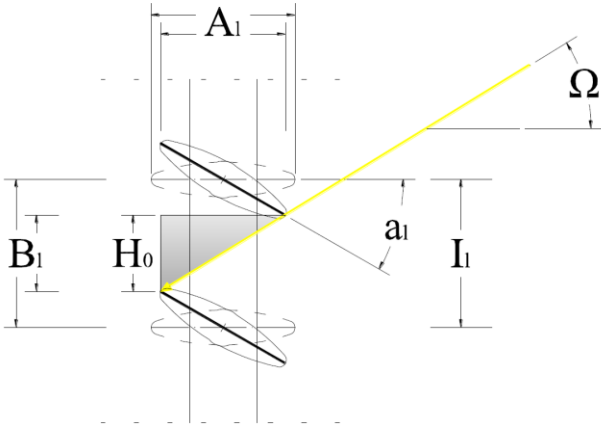
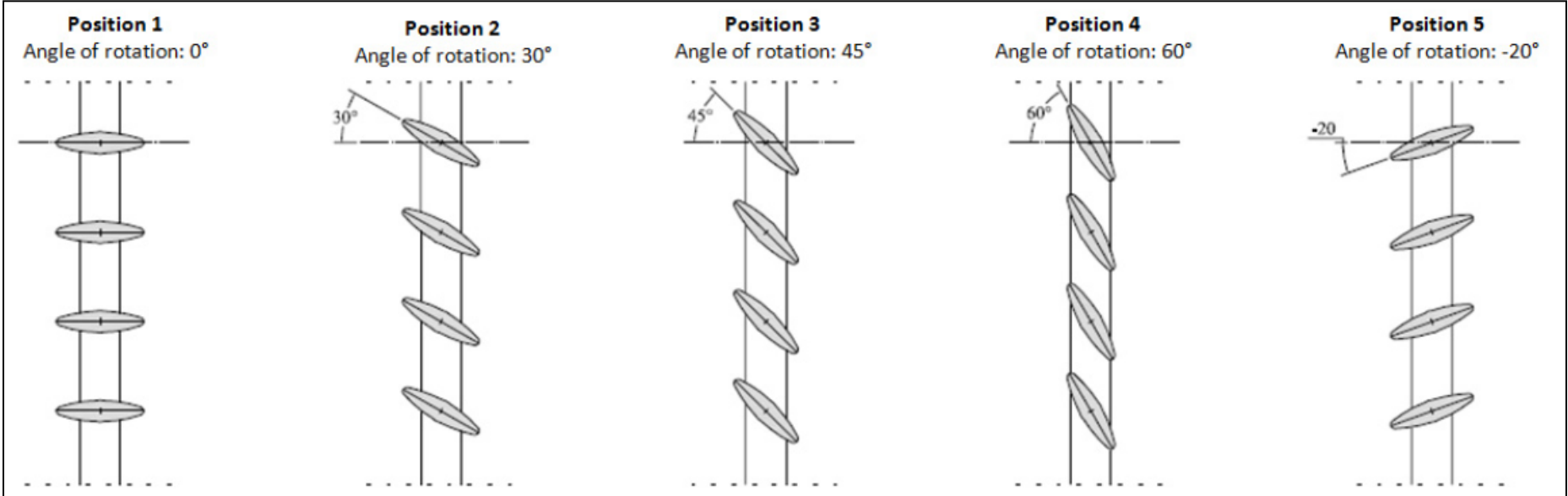
LA CAMPAGNA SPERIMENTALE (4)



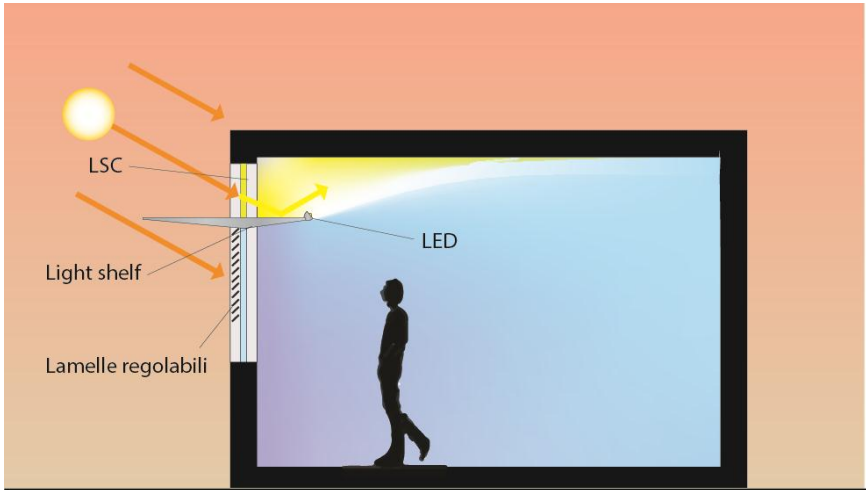
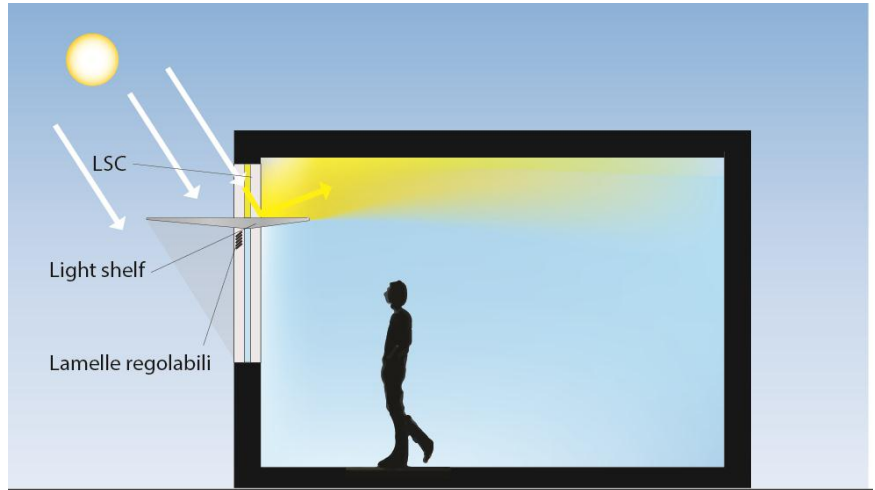
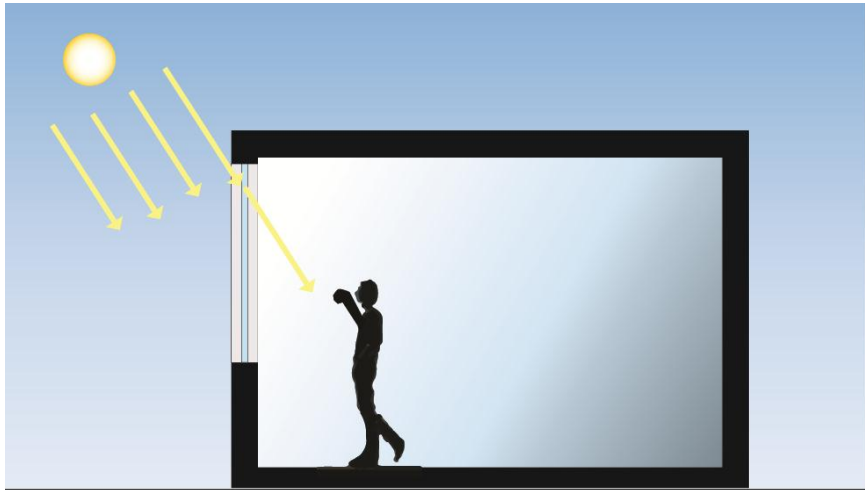
PRESTAZIONI ENERGETICHE



SVILUPPO TECNOLOGICO (1)



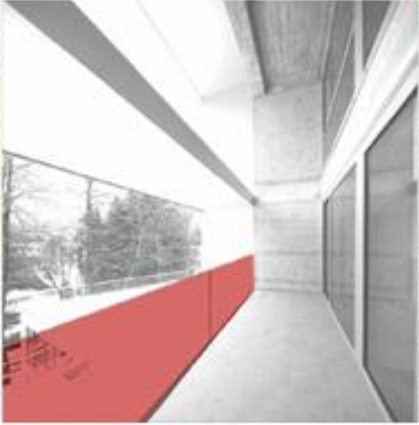
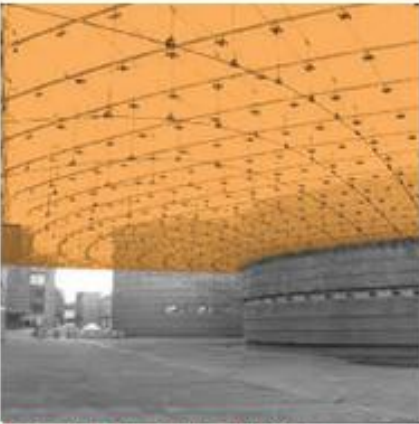
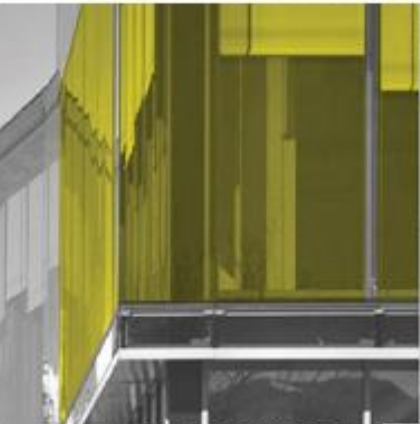
SVILUPPO TECNOLOGICO (2)



LSC DAYLIGHTING



LSC ARCHITECTURE



CAMPI D'APPLICAZIONE



BIPV



Pensiline



Pubblicità



Serre



Fotobioreattori



Automotive



Barriere antirumore