



Helvar

freedom in lighting



Helvar

“Illuminazione naturale e artificiale: l’utilizzo integrato delle fonti luminose nella progettazione. Casi studio nell’edilizia scolastica” – Bari 3/12/2015

SISTEMI DI CONTROLLO E GESTIONE DELLA LUCE PER IL RISPARMIO ENERGETICO

- **Chi è HELVAR ...**
- **Perchè scegliere un sistema di controllo**
- **Le ragioni del Risparmio Energetico**
- **La strategia**
- **I benefici**
- **Case study**



freedom in lighting

Helvar

CHI E' HELVAR ...

since
1921



1000+

references all over
the world and counting



Privately
owned



Personnel

260



90+

years expertise in electrical industry



60+

years of delivering innovative
lighting products & solutions



Turnover 2014

79,5

million €



UP TO

80 %

ENERGY SAVINGS

with Helvar advanced systems

freedom in lighting

Helvar

CHI E' HELVAR ...

Customer
service



Industry
knowhow



Compatible
offering
easy to use



Reliable



Easy
to work with



personal
contacts



Outstanding
technical support



Open for
system
integration

freedom in lighting

Helvar

SOLUZIONI DI CONTROLLO PER LA LUCE...

Active+

self-learning lighting solution



Personal, wireless lighting solution

freeDim
for wellbeing



iC Series

for Human Centric Lighting



Hybrid Dimming

excellent dimming performance



Intelligent colour



SceneSet

Custom app for controlling light



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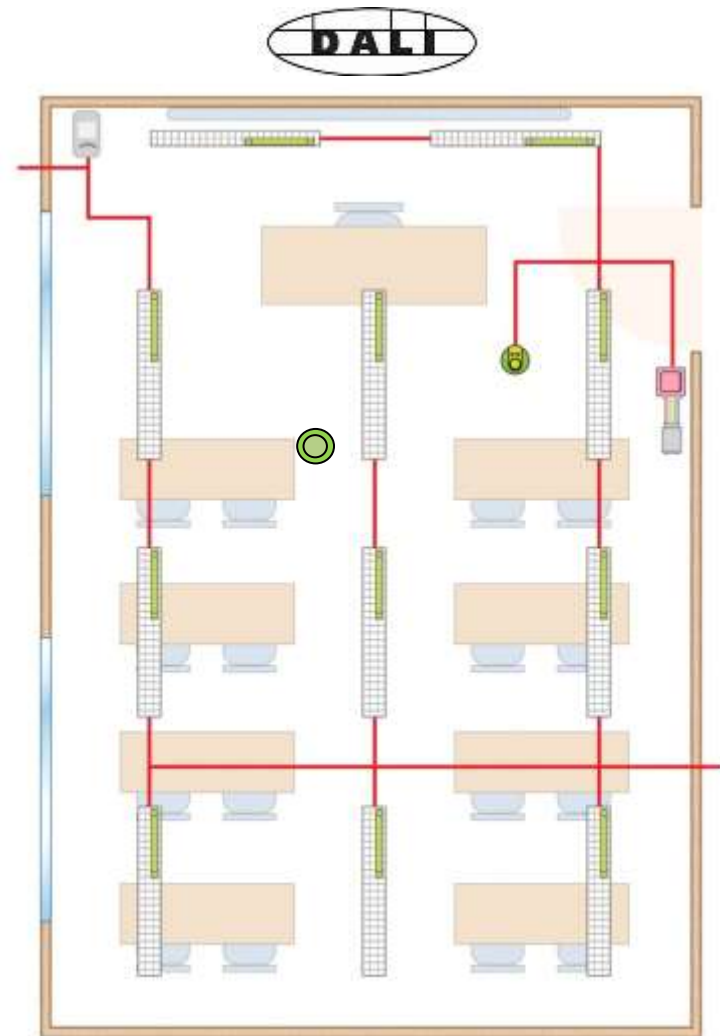


COSA SONO I SISTEMI DI CONTROLLO

Sistemi STANDALONE

In grado di controllare e gestire una singola area specifica (aula , corridoio, ecc.) o l'apparecchio di illuminazione tramite:

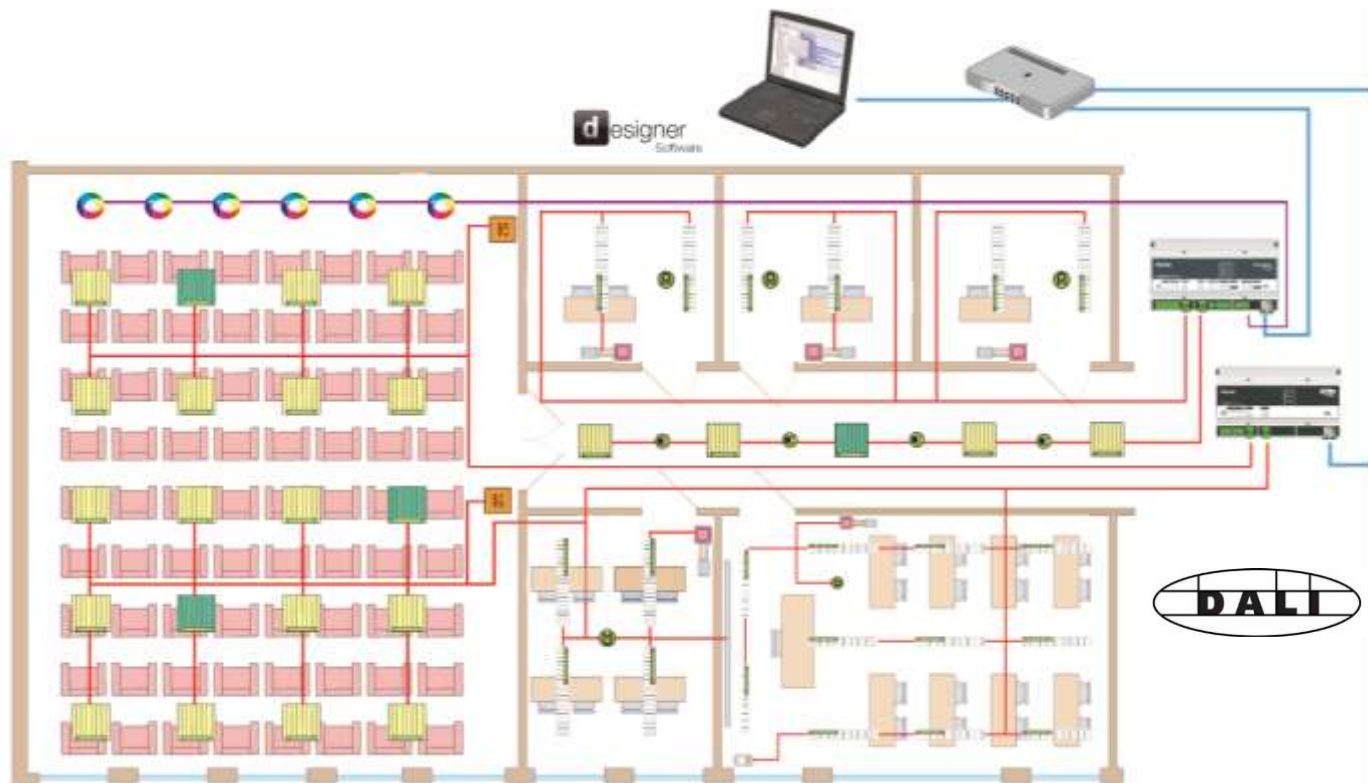
- Funzioni automatiche e controlli con sensori di luce costante o PIR
- Manualmente tramite pulsanti



COSA SONO I SISTEMI DI CONTROLLO

Sistemi NETWORK

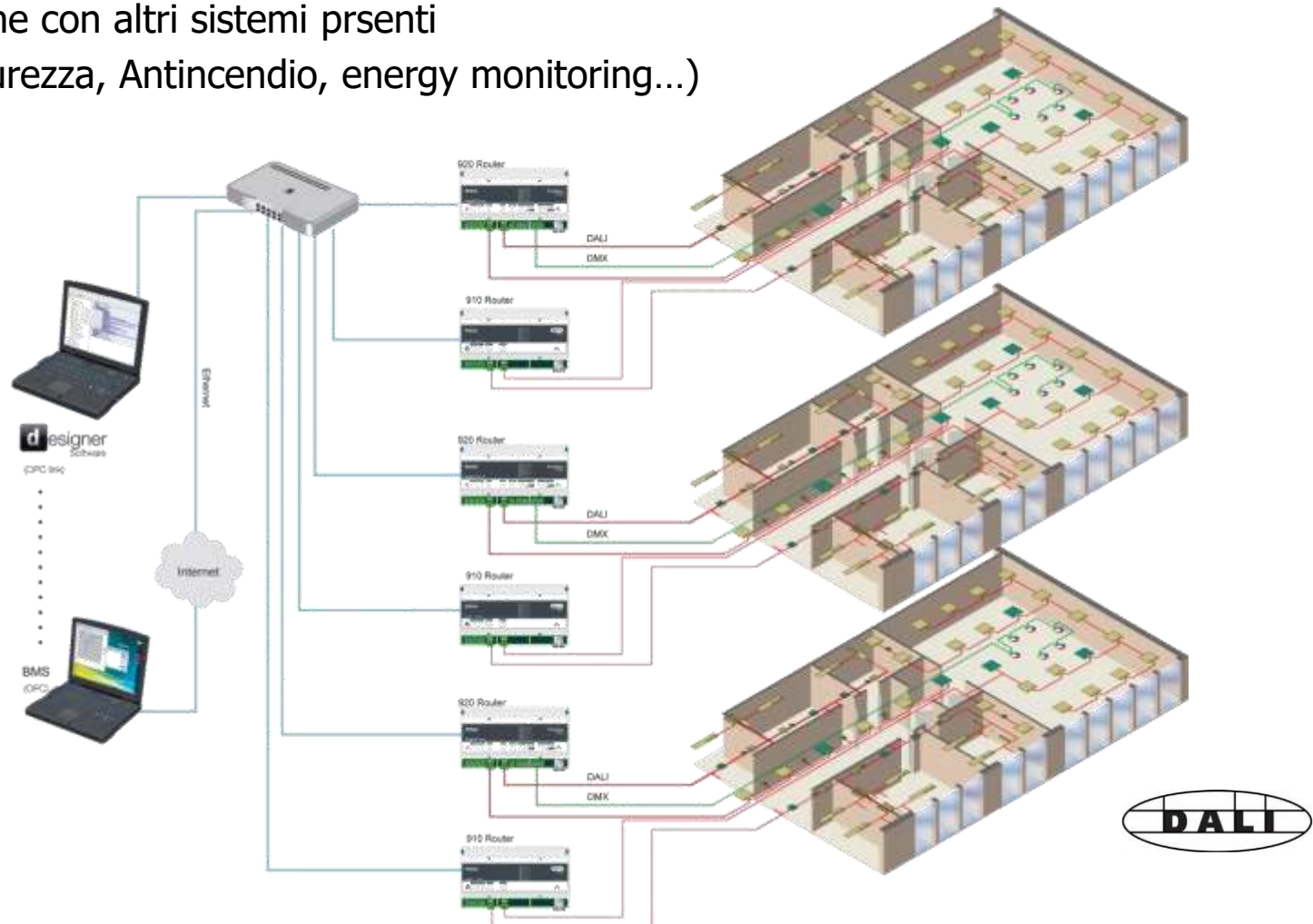
Sistema in grado di controllare piani o aree complete (aule, corridoi, locali tecnici, mense, ecc) in modo centralizzato, offrendo funzioni avanzate e di efficientamento energetico anche dal punto di vista manutentivo.



COSA SONO I SISTEMI DI CONTROLLO

Sistemi NETWORK

In grado inoltre di controllare piu' piani della stessa struttura, ottenendo l'integrazione con altri sistemi presenti (HVAC, Sicurezza, Antincendio, energy monitoring...)



PERCHE' SCEGLIERE UN SISTEMA DI CONTROLLO

- La qualità e **non solo** la quantità dell'illuminazione è un aspetto importante della nostra vita quotidiana, troppo spesso data per scontata
- Il controllo della luce è la capacità di regolare il livello e la qualità della luce in un dato spazio per compiti o situazioni specifiche
- Controllare la luce correttamente non solo migliora il feeling verso l'ambiente in cui ci si trova, ma aiuta a risparmiare energia utilizzando la luce **quando e dove è più necessario.**

PERCHE' SCEGLIERE UN SISTEMA DI CONTROLLO



PERCHE' SCEGLIERE UN SISTEMA DI CONTROLLO

La luce influenza la produzione di alcuni ormoni presenti nell'uomo.

Alcuni di questi, come dopamina, serotonina e cortisolo condizionano le **sensazioni di piacere e attenzione, la coordinazione muscolare, stress ed il ritmo cardiaco.**

Il buio al contrario induce il cervello umano a produrre melatonina, necessaria ad indurre il sonno e il ristoro del corpo.

La luce ha un immediato effetto e se l'esposizione risulta essere ripetuta può sincronizzare e migliorare il ritmo circadiano, ad esempio il ciclo giorno/notte.

PERCHE' SCEGLIERE UN SISTEMA DI CONTROLLO

- Già dai primi anni 90 era chiaro anche a livello medico che la luce solare era una cura che forniva risultati effettivi per la sindrome del Disordine Affettivo Stagionale (SAD)

Il **disordine affettivo stagionale (SAD)**, anche noto come **depressione d'inverno, winter blues, depressione d'estate, summer blues, o depressione stagionale**, era considerata un disturbo dell'umore nel quale persone con una condizione di buona salute mentale per la maggior parte dell'anno cadevano in depressione in estate o in inverno.



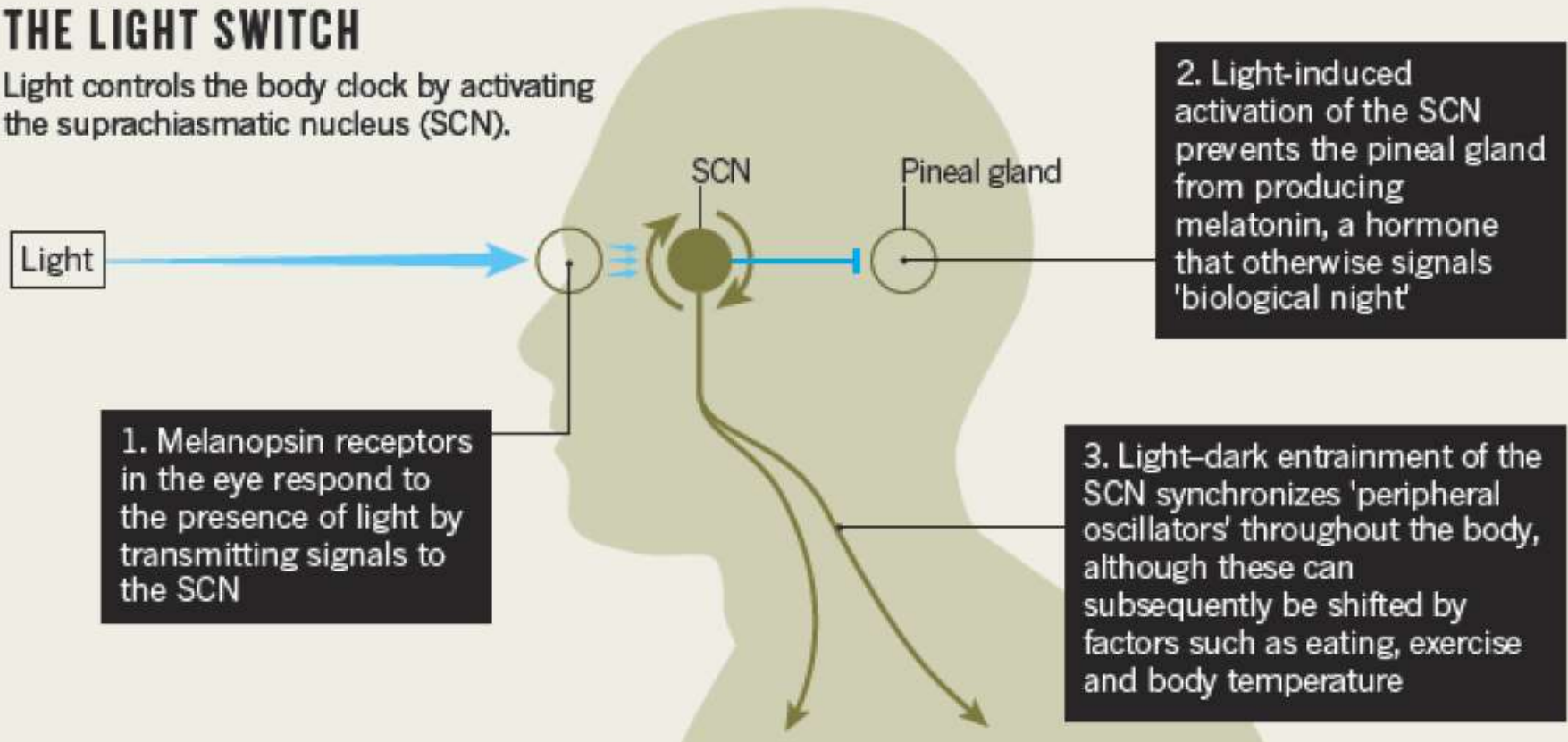
- L'illuminanza tipicamente usata sino ad allora era maggiore di 1000lx
- Durante l'ultimo decennio è stato inoltre riscontrato che anche il colore e quindi la temperatura della luce ha un **fondamentale impatto e importanti benefici per la vita umana.**

PERCHE' SCEGLIERE UN SISTEMA DI CONTROLLO

La luce ha un effetto immediato sulla vita e se l'esposizione è ripetuta nel tempo può sincronizzare i ritmi circadiani.

THE LIGHT SWITCH

Light controls the body clock by activating the suprachiasmatic nucleus (SCN).



PERCHE' SCEGLIERE UN SISTEMA DI CONTROLLO

Istruzione

Scuole, Asili, Università, Campus ...

Lighting Control: Benefici

- Comfort visivo, mantenimento del corretto livello di luce nelle diverse aree e attività presenti
- Attraverso l'attento e puntuale controllo dei livelli di luce, della temperatura colore e della direzione della luce è possibile creare le condizioni per il migliore sviluppo dell'apprendimento (Human Centric Lighting)
- Gestione centralizzata dei consumi energetici e della manutenzione
- Integrazione con BMS





PERCHE' SCEGLIERE UN SISTEMA DI CONTROLLO

- Lo sviluppo di nuove tecnologie e standard (DALI DT8) e l'uso di driver led hanno permesso che lo **HUMAN CENTRIC LIGHTING** e il controllo di temperatura/colore ora siano **realtà** utilizzabili in diverse applicazioni:

UFFICI



SANITA'



ISTRUZIONE

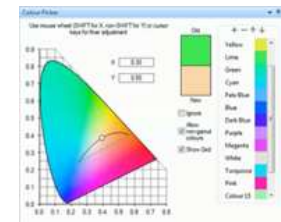
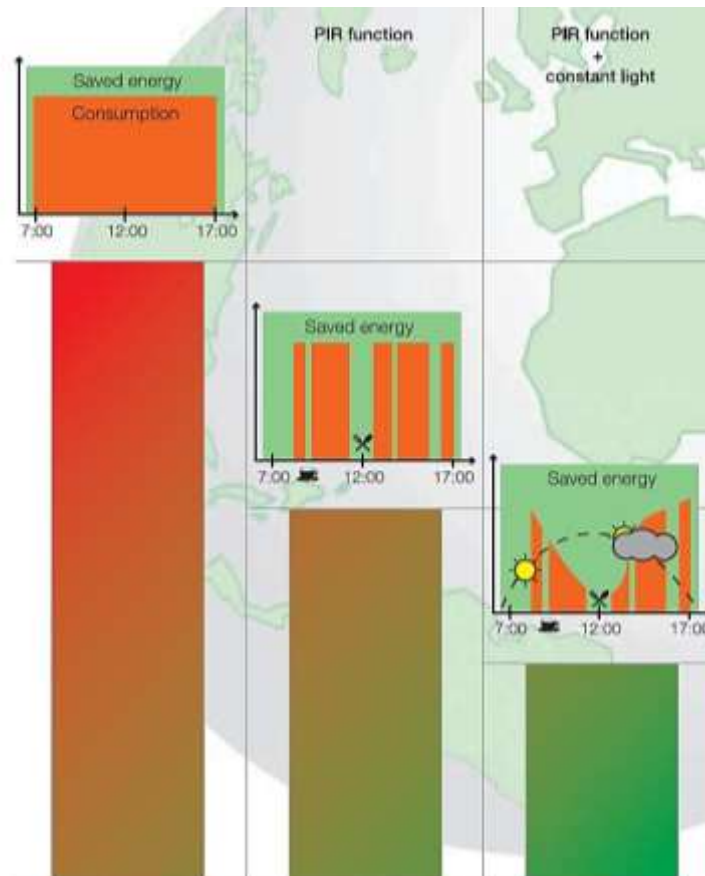


- **Chi è HELVAR ...**
- **Perchè scegliere un sistema di controllo**
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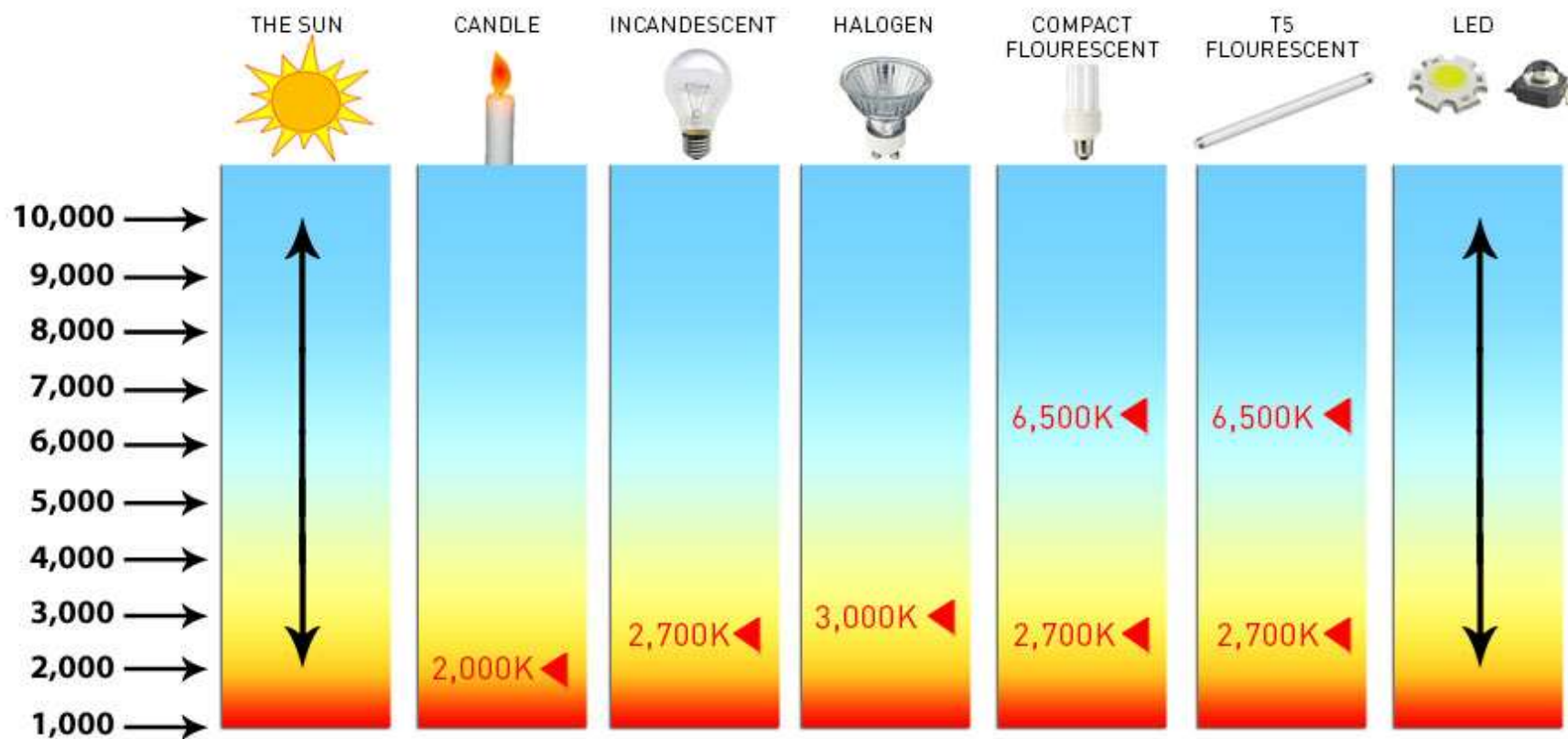


LE RAGIONI DEL RISPARMIO ENERGETICO

EFFICIENZA – PIR – REGOLAZIONE LUCE COSTANTE



LE RAGIONI DEL RISPARMIO ENERGETICO



DURATA	5 Miliardi di Anni	Ore	1,000 Ore	2,000 Ore	8,000 Ore	20,000 Ore	>50, 000 Ore
DIMMERABILE	NO	NO	SI	SI	SI	SI	SI
UV	ALTO	NESSUNO	NESSUNO	BASSO	ALTO	ALTO	NESSUNO
EFFICIENZA ENERGETICA	ALTA	BASSA	BASSA	BASSA / MEDIA	MEDIA	ALTA	ALTA
TEMPERATURA COLORE	VARIABILE	FISSA	VARIABILE PARZIALMENTE	VARIABILE LIMITATAMENTE	FISSA	FISSA	VARIABILE

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LA STRATEGIA NEL RISPARMIO ENERGETICO

Le Soluzioni

- Schedulazione e automazione del sistema di controllo
- Sensori di controllo presenza/assenza
- Controllo manuale o di override
- Regolazione della luce artificiale in funzione di quella naturale



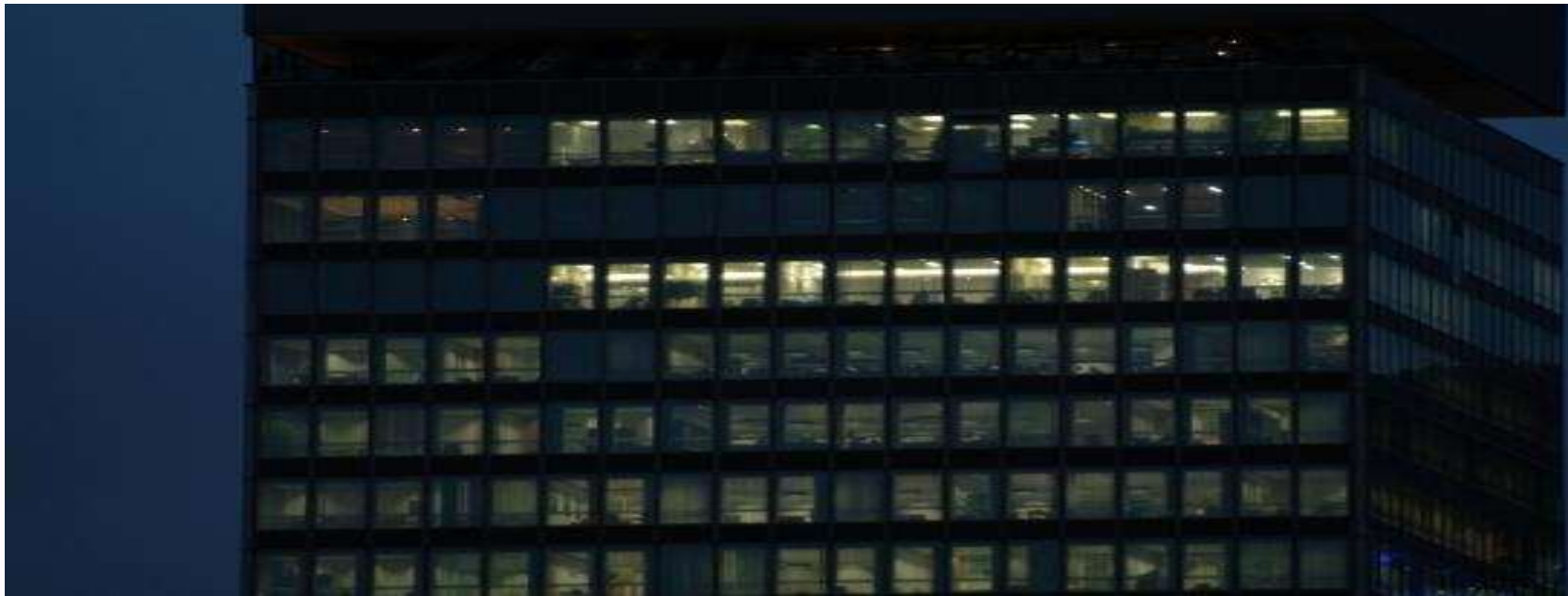
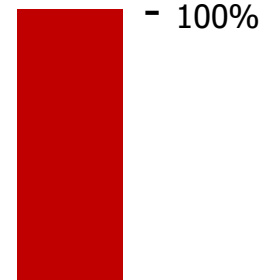
LA STRATEGIA NEL RISPARMIO ENERGETICO

Considerare il tipo di applicazione e il suo utilizzo

○ Situazione di partenza

Edificio terziario

Illuminazione senza sistema di controllo (dalle 7 sino alle 20)



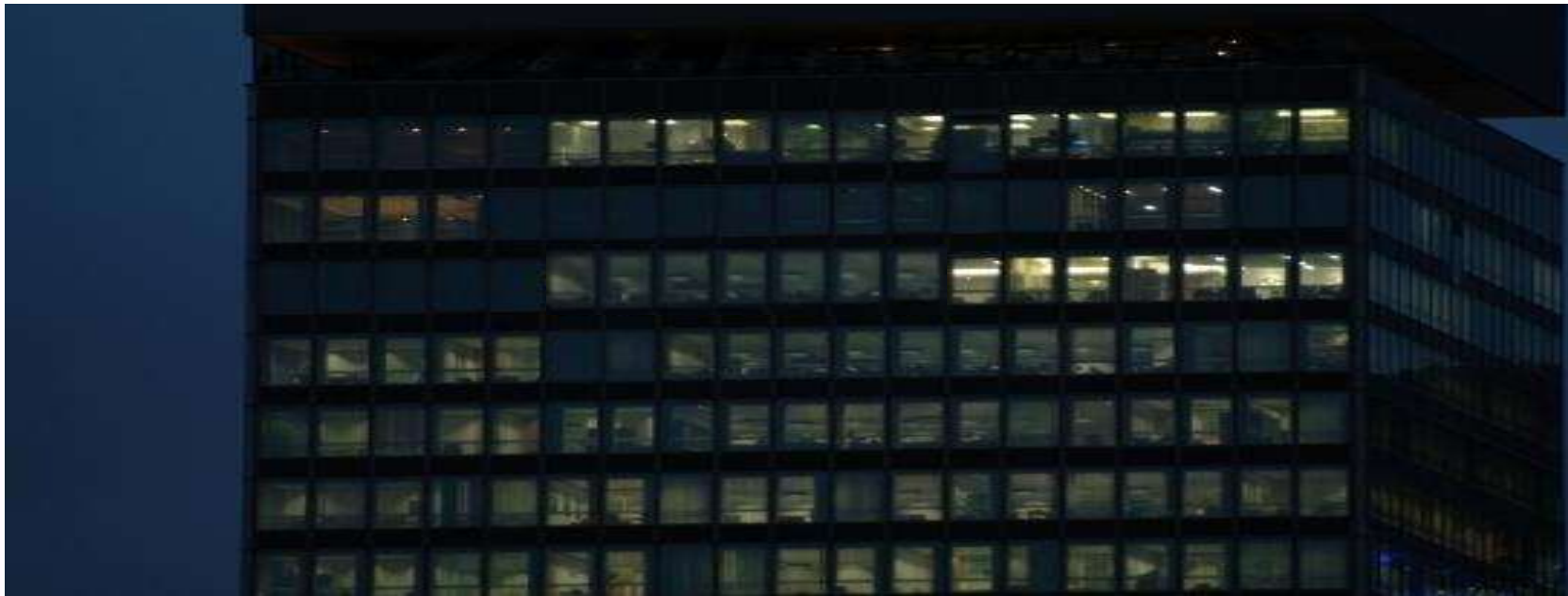
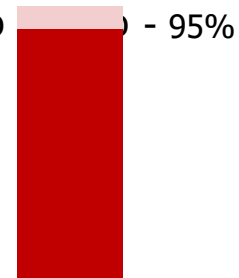
LA STRATEGIA NEL RISPARMIO ENERGETICO

Considerare il tipo di applicazione e il suo utilizzo

- Schedulazione e automazione del sistema di controllo

Automatizzare spegnimento ed accensioni solo nelle ore effettivo

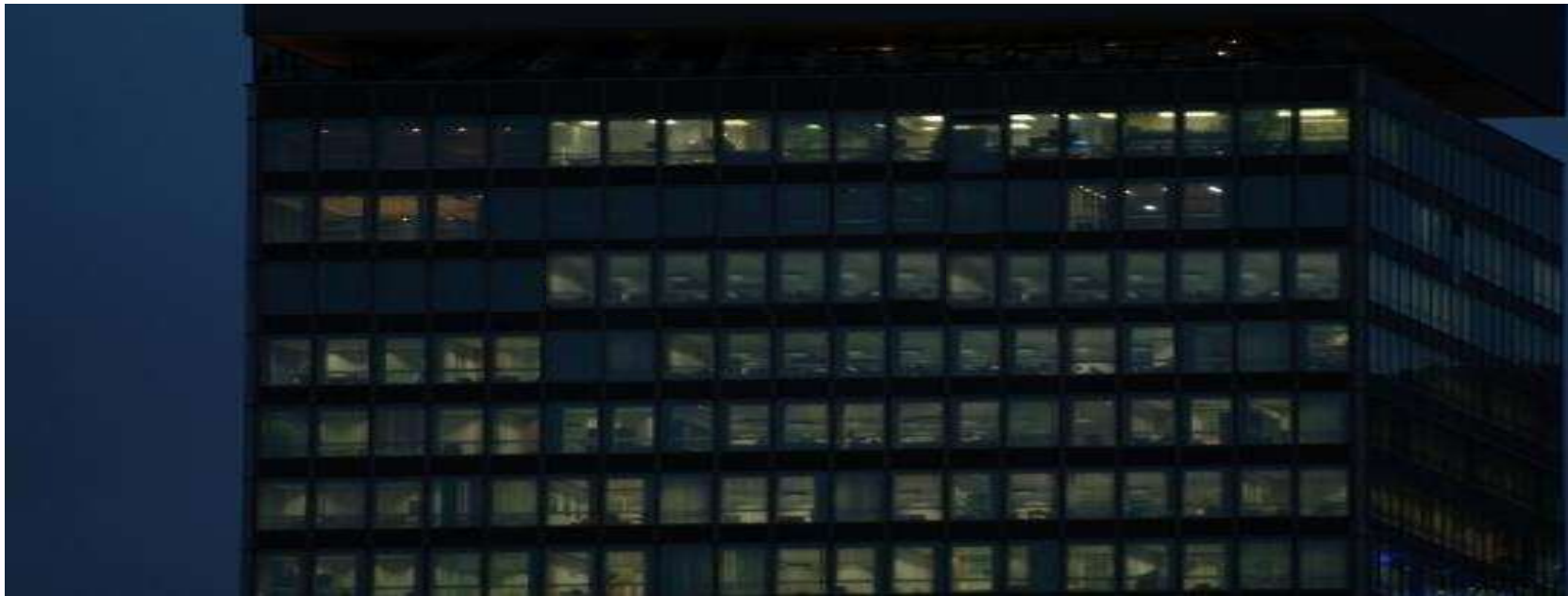
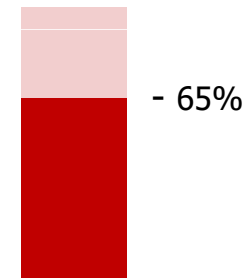
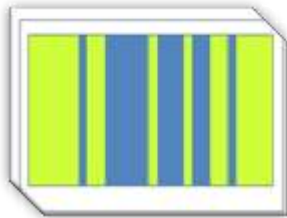
Risparmio tra il 5-15% (dalle 9 alle 18)



LA STRATEGIA NEL RISPARMIO ENERGETICO

Considerare il tipo di applicazione e il suo utilizzo

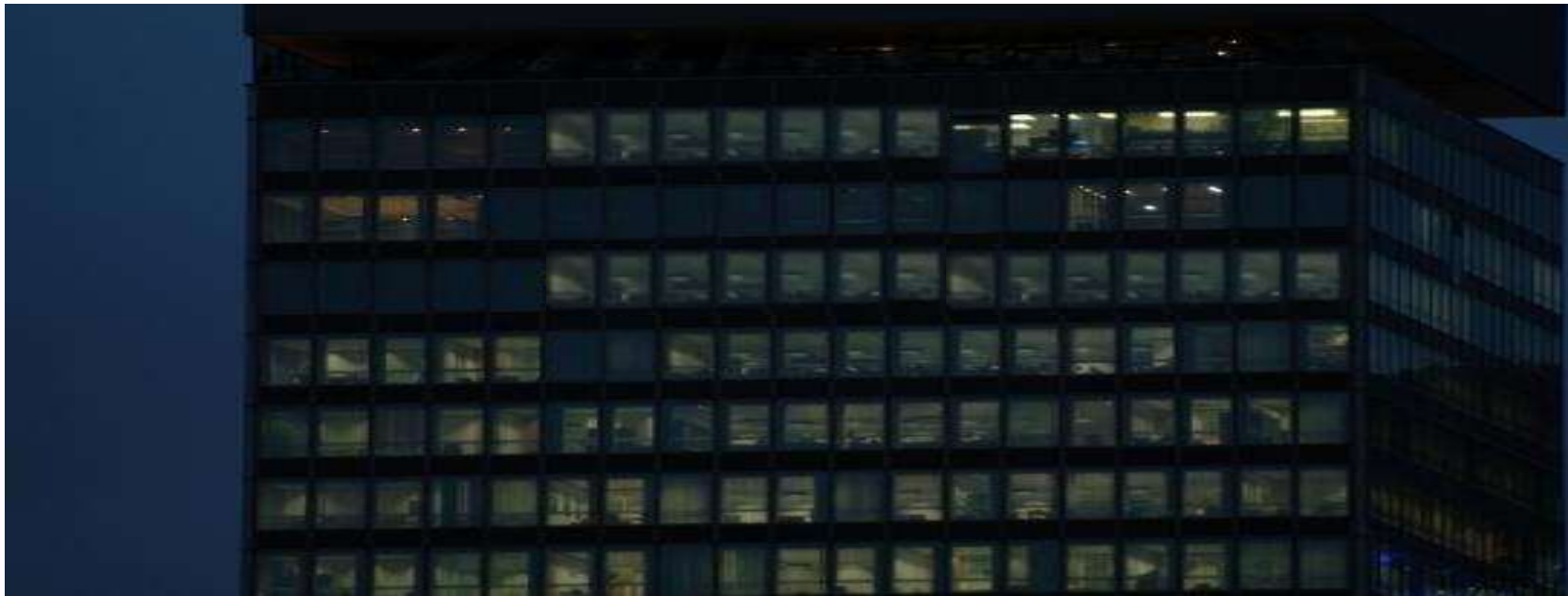
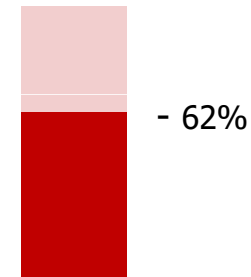
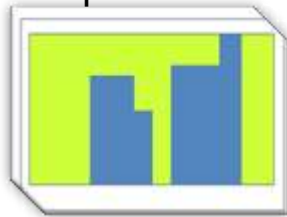
- Sensori di controllo presenza/assenza
Utilizzare sensori presenza/assenza (PIR o MW)
Le luci saranno accese solo a rilevazione presenza.



LA STRATEGIA NEL RISPARMIO ENERGETICO

Considerare il tipo di applicazione e il suo utilizzo

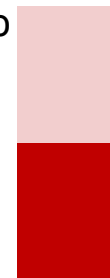
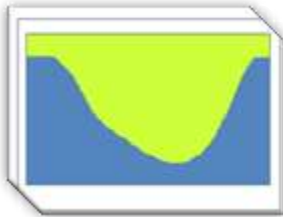
- Controllo manuale o di override
Controllo manuale delle diverse aree (comfort all'utilizzatore)
Risparmio fino al 15%



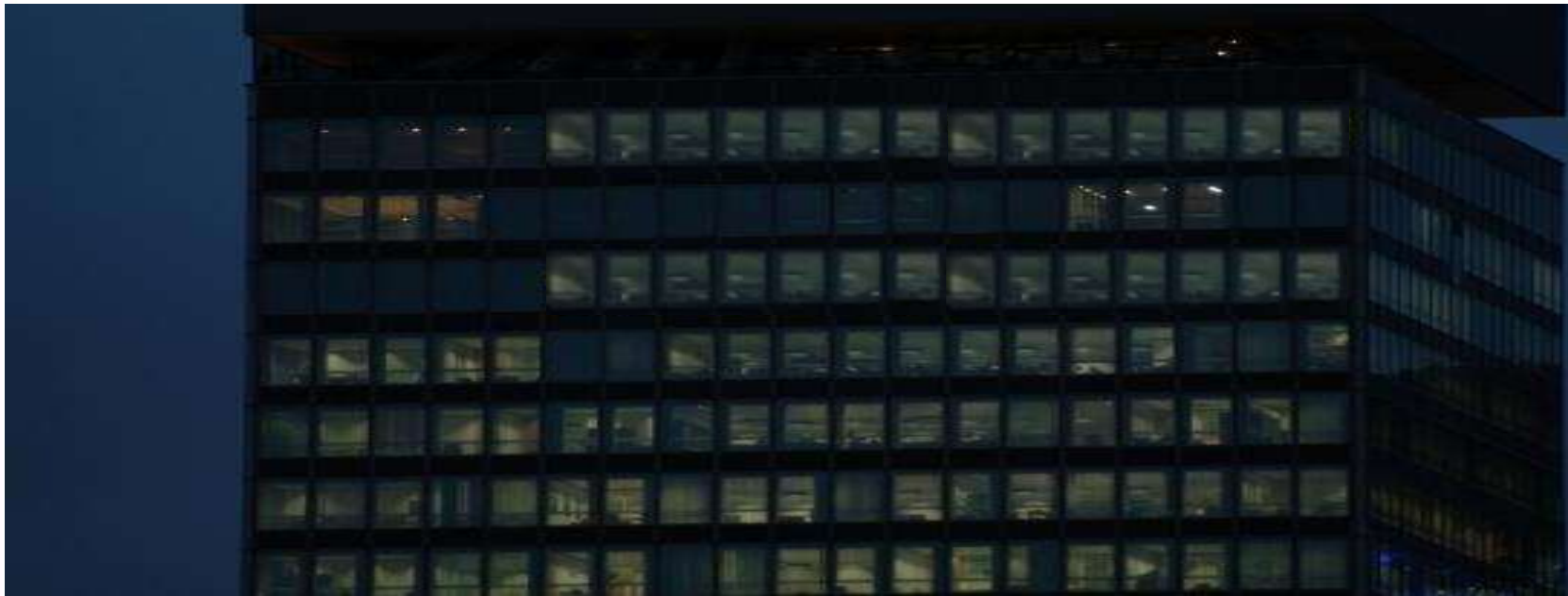
LA STRATEGIA NEL RISPARMIO ENERGETICO

Considerare il tipo di applicazione e il suo utilizzo

- Regolazione della luce artificiale in funzione di quella naturale
Mantenere un livello di luce costante, utilizzando sensori in grado di rilevare la luce naturale presente. Risparmio fino al 35%



- 62%
- 48%



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I BENEFICI

Risparmio Energetico, comfort, flessibilità e sicurezza



Energy Saving



Comfort



Flexibility



Safety

I BENEFICI

Risparmio Energetico

Benefici	In che modo
Utilizzo della luce naturale	Sensori di luce costante
Razionalizzazione delle accensioni	Sensori di presenza/assenza Automazioni e schedulazioni orarie
Utilizzo del livello di luce corretto in funzione dell'ambiente	Sensori di luce costante
Flessibilità nell'utilizzo dell'energia	Monitoraggio energetico puntuale



I BENEFICI

Comfort

Benefici	In che modo
Ottimizzazione della luce in funzione del suo utilizzo	Controllo manuale da parte dell'utente Gestione del colore (luce calda/luce fredda)
Personalizzazione del controllo utente	Controllo tramite dispositivi SMART (tablet, smartphone)
Comfort e sicurezza	Gestione delle funzioni di Corridor link Sensori di luce costante



I Benefici

Flessibilità

Benefici	In che modo
Riduzione costi di cablaggio	Modifica layout eseguibile via software
Utilizzo di protocolli standard	Protocollo aperto DALI Comunicazione ETH – TCP/IP
Funzioni avanzate	Condizioni booleane – sequenze/loop
Applicazione da piccoli ambienti sino a interi Building	Range di prodotti valido per tutte le tipologie di applicazione



I BENEFICI

Sicurezza

Benefici	In che modo
Integrazione con altri sistemi tecnologici	Integrazione con terze parti – Driver IP o interfaccia OPC integrata
Controllo dello stato del sistema	Controllo guasti integrato
Gestione dei kit di emergenza DALI	Test di durata e funzionalità batteria integrato e compreso nel sistema
Monitor consumi energetici e manutenzione	Monitoraggio energetico ottenendo i dati direttamente via bus DALI



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CASE STUDY

- Università Bocconi - Milano
<http://www.unibocconi.it/>
- Politecnico Campus – Lecco
<http://www.polo-lecco.polimi.it/>
- Polimoda Istituto
Internazionale di Fashion e
Design – Firenze
<http://www.polimoda.com/>



CASE STUDY

freedom in lighting

Helvar

Università Bocconi - Milano



CASE STUDY

THE BOCCONI UNIVERSITY: A NEW CITADEL FOR CULTURE

Text: Gae Aulenti
Pictures: Camerini Work di
Paolo Tordini

The Milan-based Bocconi University is an internationally acknowledged cultural institution. For over a century its students have made up the core of the Italian managerial and entrepreneurial class. Since 1940 the University has been located in the southern part of Milan, next to Parco Ravizza and behind the remains of the Spanish Walls. Bocconi's campus has grown over the decades and is now an entire neighbourhood within a lively residential and commercial district.

The Bocconi University is not new to hiring prestigious architects - such as Giuseppe Pagano, Giovanni Muzio, and Ignazio Gardella - for designing some of its campus buildings.

This new building represents a memorable image to confirm the important cultural contribution that the Bocconi University plays in the life of this city. It will be inaugurated at the end of October 2008 and it will house the scientific and research activities of the Bocconi University. It will include 883 office premises, a 1,000-seat "Aula Magna" - divided into two separate halls each with a foyer and other spaces for meetings and exhibitions - and an underground parking place capable of accommodating 200 cars.

In 2002 Ireland-based Grafton Architects won the competition to design the new building. A prestigious competition jury unanimously declared Grafton's design the winner, saying it presents from the start a mean-

ingful and correct relationship between the immediate external urban context and the internal context of the university, and innovative technological solutions.

The multi-opening citadel expresses at one time modernity in its structural and technological solutions, and solemnity in its wide empty spaces. The volume of the Aula Magna accounts for an almost sacral space, while a dynamic core made up of offices, research labs, libraries, and internal squares fills the surrounding space.

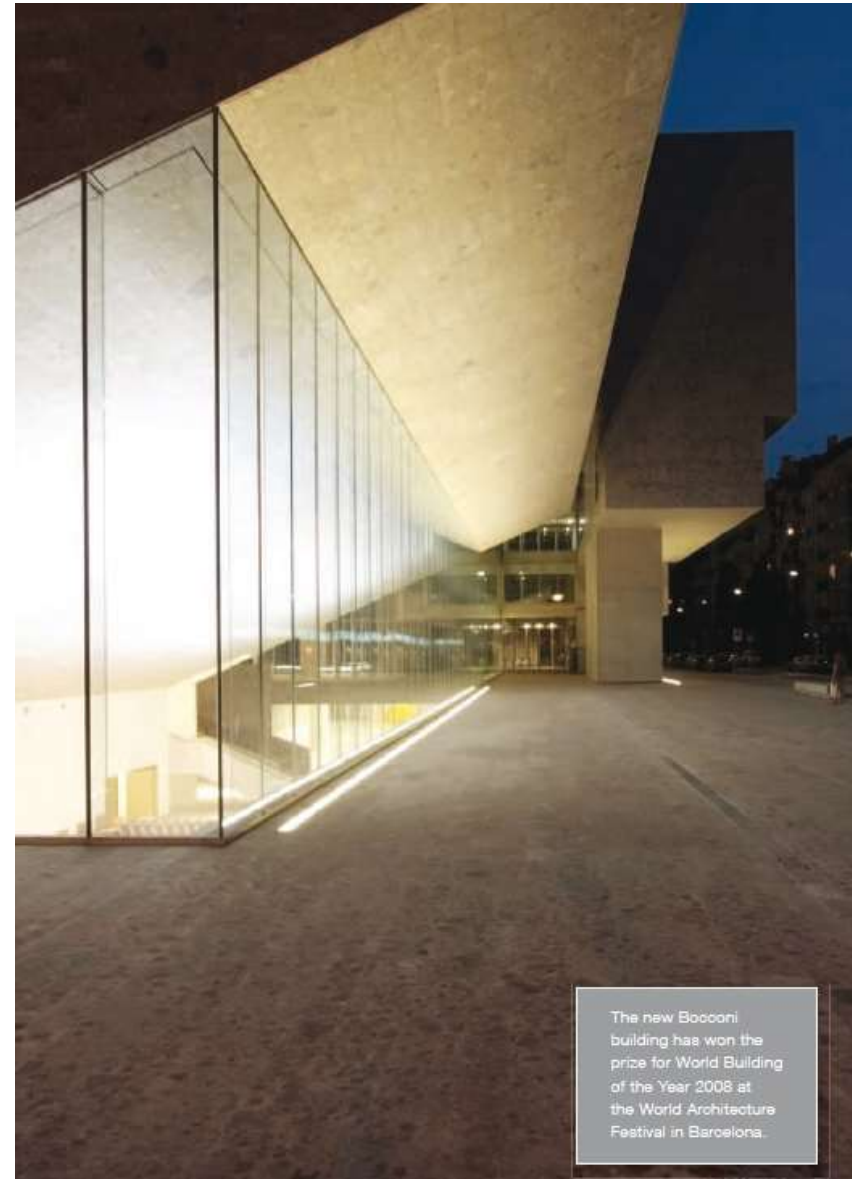
Although not fully visible to the visitor, innovative architectural and technological solutions make this building particularly efficient: sophisticated foundation work (14 m deep into the earth), and an energy-efficient lighting system. Helvar is proud to be part of this enterprise as provider of lighting control systems and digital power supply units for the foyers, the Aula Magna, and all the offices.



freedom in lighting

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Università Bocconi - Milano



The new Bocconi building has won the prize for World Building of the Year 2008 at the World Architecture Festival in Barcelona.

CASE STUDY

freedom in lighting

Helvar

Università Bocconi - Milano

The Aula Magna - a window to Milan

The entrance to the campus opens on the artery of Viale Bignini and the Aula Magna - a true 1,000-seat theatre - is placed hard against this artery to stress the strong link between the Bocconi University and Milan. Seen from the street, the Aula Magna - with its tall glass windows and the large empty space of the foyers - has a very strong scenic impact, like "a window to Milan". When you enter this space, the impact is definitely strong and unforgettable. Here glass, concrete, and local stone mix with light-coloured glossy marble, which enlightens and enriches the environment with numberless reflections.

This space celebrates the "grandeur" of the University housing it, like a cathedral devoted to the economic culture but still capable of representing a loftier concept of universal culture.

A large place of exchange

The beehive world of offices and research labs is suspended between ground and sky. It is housed in elevated bodies overlapping the public spaces. It is an organized, flexible and interactive labyrinth, where workspaces alternate with courts and cantilevered gardens. A careful section analysis allowed the designers to effectively alternate full and empty spaces for filtering natural light to all levels, including those located 9 m underground.

Natural light - artificial light: energy saving and efficiency

While architects perfectly know how to exploit the potential of natural light, lighting control system experts can help them effectively exploit the potential of artificial light.

"It was extremely important - explains Mr. Luigi Amman, the engineer in charge of lighting control system installation - the entire building to be equipped with an efficient, state-of-the-art lighting system to achieve the right balance between visual comfort, energy saving, functionality, and look-and-feel."

In large buildings such as this one energy costs are inevitably high, unless due action is taken during the design phase to include the appropriate energy saving

technologies to cut down such costs. For the about 900 offices, the corridors, the foyers of the Aula Magna and the smaller premises, the project envisaged the use of fluorescent lighting through new-generation luminaires designed by Mr. Bonucelli, the Architect in charge of the interior design. The choice of fluorescent light as against other types of light sources already entails energy saving to some extent, which can be further incremented by using digital electronic ballasts capable of controlling the flow of light based on actual lighting needs and ambient light conditions during the day and the year.

One more step towards full energy efficiency was represented by the installation of a lighting control system capable of controlling the various parts of the lighting system in an organized way. In the case of the

interconnected through DALI bus systems that handle each individual row of offices.

To allow for centralized management, Helvar installed 60 DALI / LON Gateways and 7 DIGIDIM Routers for easy communication between the DALI networks and the central control system. The choice of DALI bus systems and digital electronic ballasts allows for easy scaling and enhancement of the system architecture by integrating it with other performance enhancers, such as presence detectors, light sensors, etc.

The two foyers of the Aula Magna - characterized by long rows of lights following the geometry of the glass windows' spines - called for totally different system design and requirements. In this particular case, it was extremely important to control individual luminaires in

the installation from an easy-to-use control panel and recall default scenes or programme new ones according to specific needs.

Last but not least, for the classrooms on the second floor a Helvar DIGIDIM system was used, which allows to recall the default scenes through an ad hoc keypad: entrance light, projection light, speaker's light.

This was indeed a complex and demanding project, whereby the strict cooperation between designers and engineers proved to be of critical importance. "As in other previous projects - confirms Mr. Amman - the availability and competence of Helvar's staff allowed us to choose the best solutions for the various premises and to be flexible enough to adapt to all the changes requested by the Customer".



In large buildings energy costs are inevitably high, unless due action is taken.

Bocconi University, the fruitful cooperation between Mr. Amman and Helvar's experts led to the adoption of a specific lighting control system for all the offices and another one for the foyers and the smaller premises.

The five floors housing the offices develop into an ordered mesh of corridors, into which one or two rows of office doors open. Each office has one suspend luminaire with direct light and dark optic. The T5 lamps are powered from Helvar high-frequency DALI ballasts (EL-s). The lamps are all

a flexible way and change the programme as needed. Indeed, each foyer is not only used as a passageway to the Aula Magna, but also as an active space for exhibitions and other events.

For the time being, all luminaires are controlled as a whole. In the future, however, the customer may want to be able to turn on only some rows or groups of ballasts. By exploiting the Ethernet data network, the DIGIDIM Router connects and controls a potentially infinite number of DALI networks allowing the creation of an extremely versatile and scalable system. University personnel can now control each section of

The Bocconi University

Equipment

- 7 DIGIDIM Routers (910)
- 1500 x Digital electronic ballasts (EL-s)
- 1820 x Standard electronic ballasts (EL-s)
- 50 x Power Supplies (402)
- 50 x DALI / LON Gateways (430)

Lighting Designer / Specifier: Studio Amman, Milan
Contractor/Installer: Ambro Elettrica, Milan

CASE STUDY

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Politecnico Campus - Lecco



CASE STUDY

freedom in lighting

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Politecnico Campus - Lecco

TEXT Gaia Damiani, Damiani Communication / Kirsii vanSol, Complesso
PICTURES Politecnico di Milano, Polo di Lecco

Campus of the Future is here

Since January 2013, the futuristic Lecco Campus of Milan Polytechnic occupies the former hospital in the heart of Lecco city. Setting a whole new standard for the Italian academic world, the Polytechnic uses experimental and groundbreaking methods even in its teaching and research, focusing on quality and innovation, and creating fruitful cooperations in the surrounding area.

Helvar was chosen to design the lighting control systems in the massive project. It is no coincidence: known as an eco-sustainable forerunner, Helvar's philosophy is in complete harmony with the ambitious project.

HOME OF SCIENCE, OPEN FOR EVERYONE

The Lecco campus gives a new lease of life to a part of the city that had fallen into disuse. New structures have been added to the former hospital building, creating an open university that is both visually and practically in sync with the area.

Architect Paolo Bodega created a transparent and "open" building seamlessly interacting with the city. This centre of science in the heart of the urban environment is shared by the students and locals alike, as the city people are welcome to use parts of the campus or to just stop by in the wi-fi garden, connecting with the rest of the world.



Bodega chose materials that symbolise of the area: aluminum, steel and glass. Light, luminous and predominantly white, the campus stands out against the city skyline. There is a strong sense of continuity between the indoor and outdoor areas, connected by large windows.

The Campus will be completed by 2015 with the building of a new university residence and a laboratory complex, which will be shared with the scientific teams of Milan University.

“

Lighting in the classrooms is controlled with Multisensors, providing constant light functionality for daylight harvesting.

VISUALLY STRIKING, ENVIRONMENTALLY SUSTAINABLE

The designers were very clear in their focus on sustainable construction technologies and energy efficiency of the systems and installations. Principal Mr. Azzone says: "This new campus is experimenting with a model of a future university. It serves as an example for the entire country: synergy between technology and art, between research and enterprise, innovating and hard work".

A prefabricated system was used for construction allowing for rapid building and a clean construction site. Renewable local energy resources - water, sun and air - offer clean energy and limit emissions of carbon dioxide, thus earning the building energy classification B.

A modular system of heat pumps using underground water is used for air conditioning. There are also solar panels and wind thermal panels on the roof. "It is a green university, built with mainly recyclable materials. In 40 years' time, the structure could be dismantled and reused as part of a renovation project," says Paolo Bodega.

INTELLIGENT LIGHTING CONTROL WITH DALI

The technologies chosen to improve energy performance include the Helvar DALI lighting control system. The DALI system has been designed to control the areas with the most natural light, since they look out onto the courtyard and have large picture windows. The lighting system in the classrooms, offices and halls uses daylight harvesting to optimise the use of natural light. In the classrooms, the scene setting is also possible.

In the interior areas - such as the corridors - with less natural light and where the principal need is safety, lighting is managed with presence detection sensors. Mr. Gniech,

Spanning approximately 30,000 m² with 27 classrooms and almost 2,800 seats, the renovated campus is the flagship of the Lecco area.



CASE STUDY

freedom in lighting

Helvar

Politecnico Campus - Lecco



an engineer from Elettromeccanica Galli, explains: "We have worked with the Helvar staff to create a user-friendly, simple layout that is easy to manage and operate. Once the installation and programming is complete, the customer will be able to manage day-to-day use of the system independently".

Each floor is equipped with Helvar DIGIDIM routers. Lighting in the classrooms is controlled with Multisensors, providing constant light functionality for daylight harvesting. Commissioning and maintenance of the installed DALI luminaires (fluorescent 1x80W) is achieved through DALI router system. Each classroom has a push-button panel positioned near the lecturer's desk for selecting different lighting scenes and controlling the blinds as needed.

Light level is maintained at a constant 500 lx with the Multisensor 312. The lighting system provides optimal energy efficiency and ideal lighting comfort. "All the luminaires of the university are controlled and it is possible to check the status of each luminaire by a central computer. This allows constant monitoring on energy consumption by area and also monitors the emergency lighting system", Gnechti continues.

Helvar's experience in large-scale projects offered the best technical and programming skills while keeping the tight time schedules in the massive building project. An outstanding result, in view of the size of the building complex.

Milan Polytechnic – Lecco Campus

- Project duration: Dec 2010 – Jan 2013
- Construction area: 30.600 m² Volumes of the buildings above ground: 60.200 m³ Gross floor area: 16.200 m² (of which 11.000 m² of new building and 5.200 m² renovation of existing buildings)
- Designers: Paolo Bodega, architect, Lecco
- General Contractor: Colombo Costruzioni, Lecco
- Plant engineering: Technion, Lecco
- Construction project and installation of the electrical system: Elettromeccanica Galli, Erba

CASE STUDY

freedom in lighting

Helvar

Polimoda Istituto Internazionale di Fashion Design e Marketing - Firenze



Polimoda School Of Fashion
Florence, Italy

The historical mews of Villa Favard, located in the heart of Florence, was restored and equipped with innovative technological solutions for hosting the students of this prestigious "school of fashion"

Project Requirements

In 2011 this 18th Century mews in Florence was renovated to house classes for hundreds of students from around the world. Part of the specification for the refurbishment was to make some significant improvements to optimizing and equipping the instructional spaces, with the explicit intent of offering students a unique context in which to develop creativity, inventiveness, and talent.

In particular, there was a requirement for an innovative lighting system capable of exploiting natural light as much as possible in the classrooms, thus maximizing both comfort and energy savings. A Helvar Lighting Control System was chosen.



Applications

19x Classrooms
Teaching Labs
Lecture Hall

Kit List

5x Digidim Routers
18x Multisensors
8x Modular Keypads
1x Remote Control

Solution

The classrooms have large glass windows and serve different purposes during the day, so they are equipped with a lighting system able to smartly mix natural and artificial light for the best visual comfort of students and teachers.

To achieve this, a combined lighting control system manages luminaire on/off status and dimming based on the inflow of natural light in various daylight scenarios.

Light sensors were installed in each classroom. All luminaires are powered by a DALI electronic ballast and are connected to one another and to the sensors by a Digidim Router, which is the core of the lighting control system. The router collects the info from the light sensors and uses it to accurately adjust each and every single luminaire to obtain optimized lighting conditions. The Digidim Router also allows the recall of various default lighting scenarios: All On, All Off, Speaker, Projector.



Q&A

Helvar

Grazie

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