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# Overcoming Barriers to Implementation of Low Energy Buildings

# INTEGRATED HVAC & DAYLIGHTING SYSTEMS

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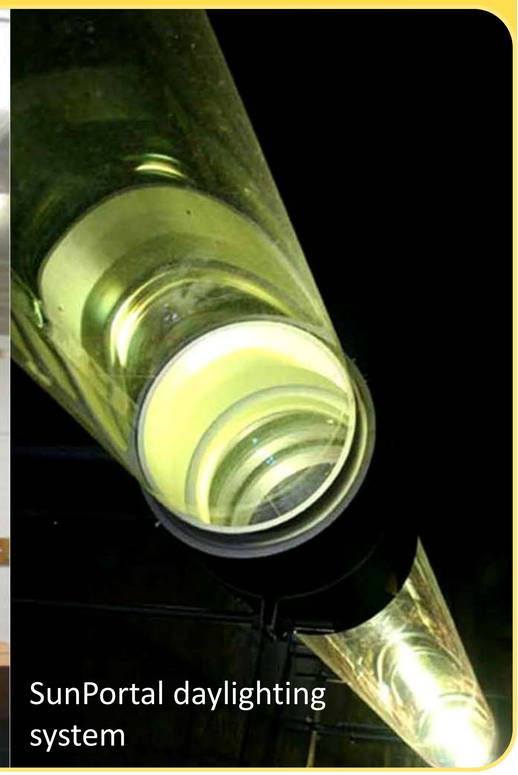
## 1

**Light pipes (ducts) are used to channel collected daylight into building core and windowless spaces.**

Heliobus daylighting system



SunPortal daylighting system

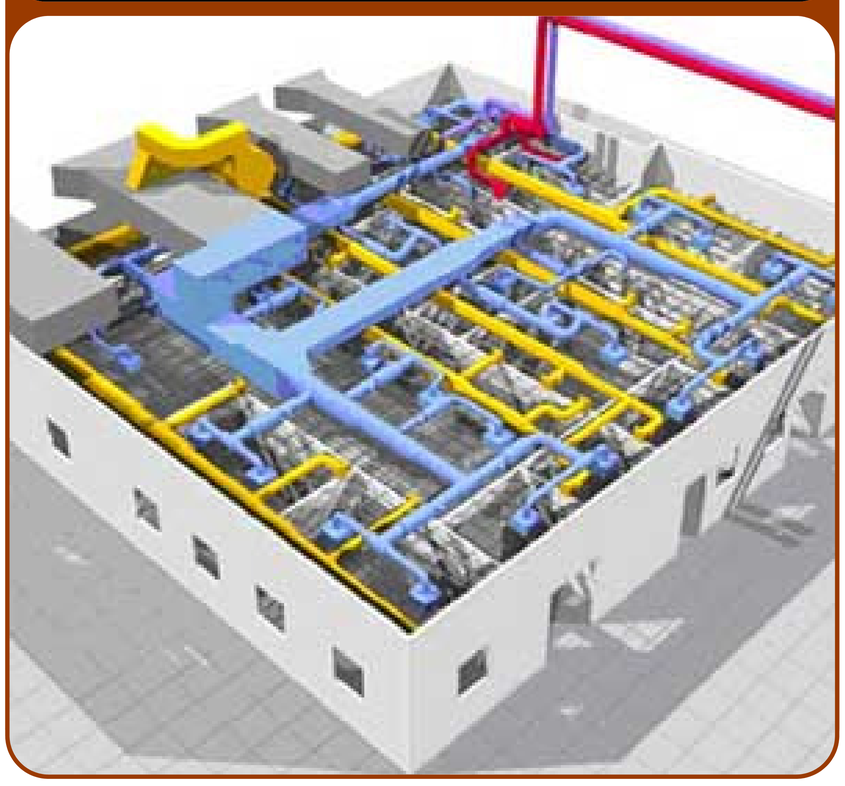
## 2

**Coats and installation difficulties, due to big size of light pipes, prevent widespread implementation.**

Light pipe

## 3

**Dual ducts, transfer both air and daylight, are suggested to ease installation and minimize conflicts between building systems.**



## 4

## OBJECTIVES

The proposed system aims to ease the installation of the Daylight Guidance Systems (DGS) and reduce the capital cost.

The **dual ducts** are connected to façade mounted and/or roof mounted daylight collectors, in addition to the HVA system outdoor cooling unit.

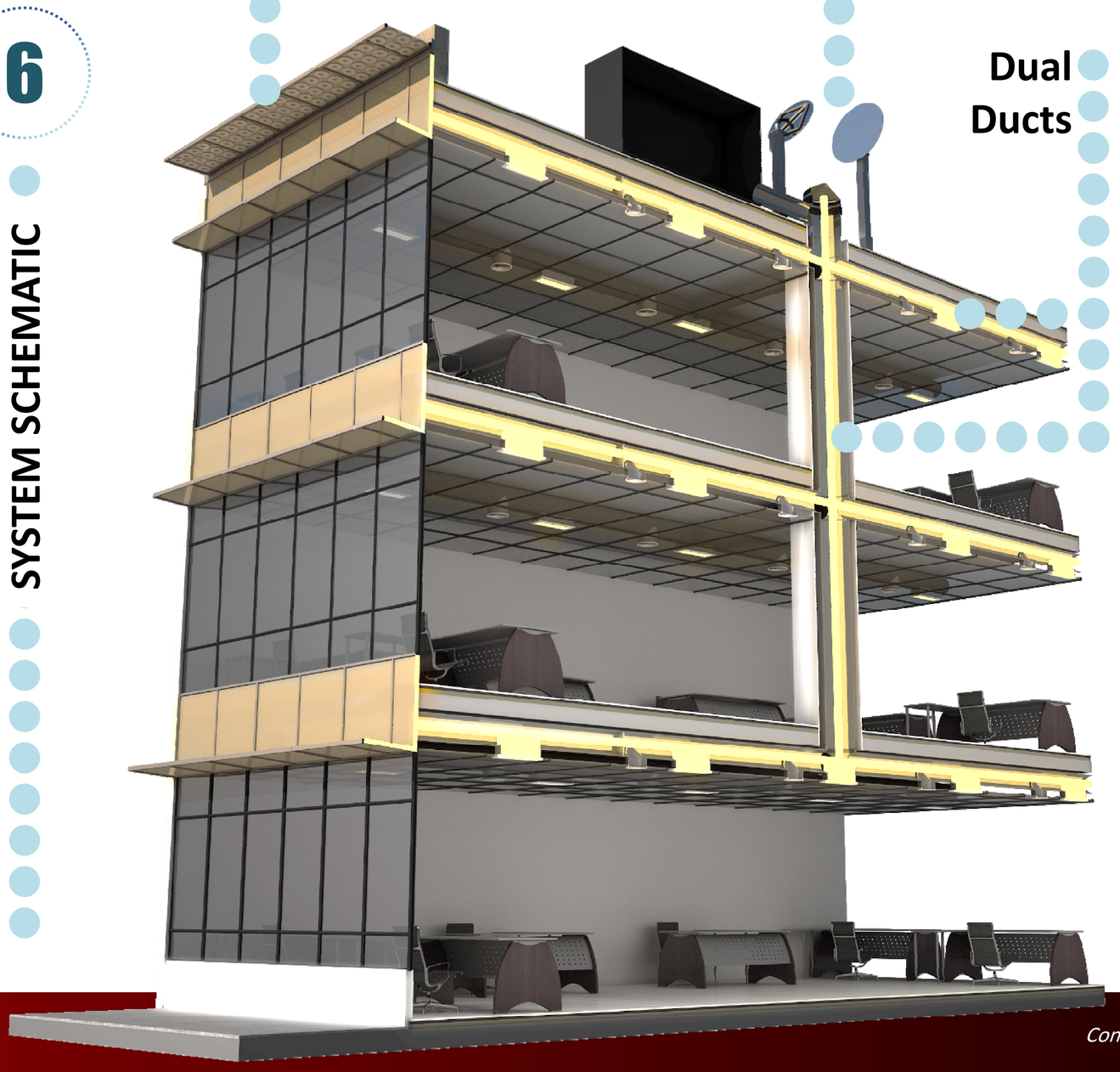
## 5

## SYSTEM DESCRIPTION

**Dual function ducts are proposed.**
The integration between Daylight Guidance Systems light ducts and the widely used HVAC ducts emerges as a novel and promising solution. The integrated dual ducting system has the potential to maximize the utilization of daylighting, reduce costs and avoid conflicts between building systems.

## 6

## SYSTEM SCHEMATIC



Dual Ducts

## 7

## DESIGN CONCERNS

- Highly reflective ducts should be used
- Air filters are necessary to avoid particle precipitation
- Thermal and acoustic insulations are required
- Optical fire dampers are necessary to avoid fire and smoke spread hazard
- Separate or hybrid output devices may be used

## 8

The proposed system is very practical and benefits from the available facilities and devices to produce a new product and propose a new design approach.

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