

Halton Chilled beams

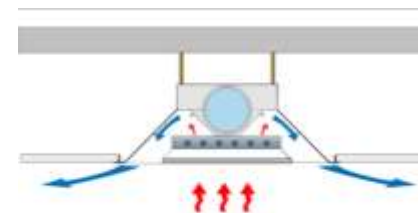
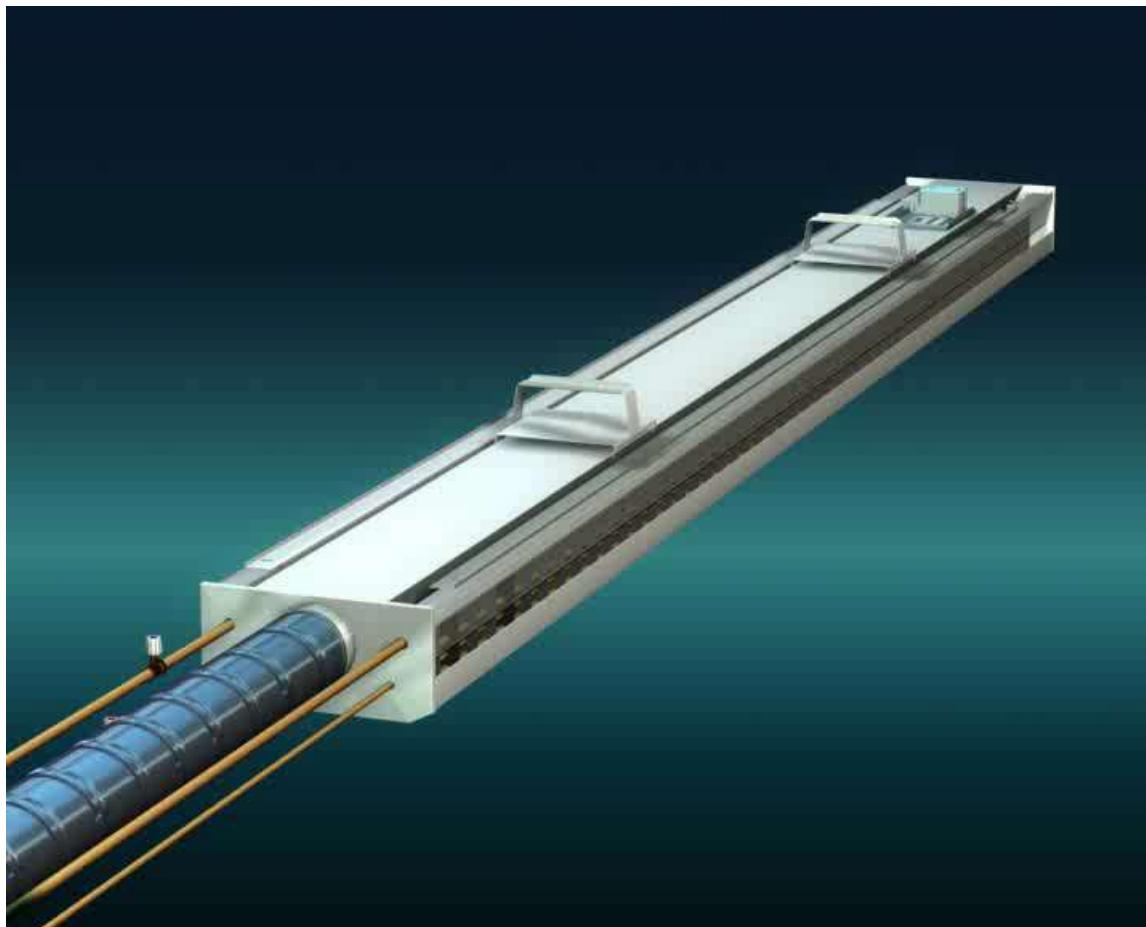


Janne Summanen
Halton Oy

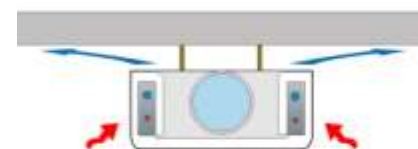
Beam presentation

Halton
INDOORS

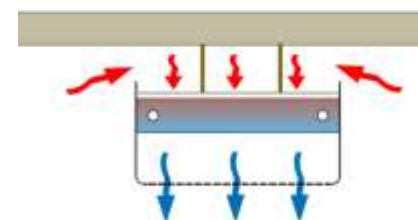
Active chilled beam operation principle



Active chilled beam for
suspended installation



Active chilled beams
for exposed installation



Passive chilled beams

Passive Chilled Beam Solution



- For projects where
 - Ventilation rates are relatively high
 - Spaces are high
 - Existing ventilation system is preserved.
 - Cooling demand is high
- Ventilation by using a separate system e.g. under-floor air diffusers, ceiling diffusers or displacement

Active Chilled Beam Solution in Offices



- Excellent indoor conditions:
 - Desired thermal conditions
 - Good indoor air quality
 - Individual conditions
- Low energy consumption:
 - Air-water system
 - Moderate airflow rate
 - High temperature cooling system
 - Low temperature heating system
 - Demand-based ventilation
- Workplace flexibility:
 - Flexible positioning of office and meeting rooms
 - Minimized churn costs

Exposed Active Chilled Beam Solution



- Excellent indoor conditions
- Low energy consumption
- Workplace flexibility
- Increased volume of space
- Savings in installation costs
- Additional floors can be built

Multiservice Unit Solutions



- Platform where we start to devolve solution for customers
- Factory build total solution for office spaces
- Architect can build own visual desing
- Demand-based ventilation
- Lights (T5 or LED), acoustic absorption material, detectors, PA speaker, sensors, cables, and place for sprinklers are integrated in one factory made unit:
 - One source responsibility lowers the risk and saves time and money
 - Reduced installation time (ready to install units)
 - Better quality of installation (made in factory instead of building site)
- Excellent solution for refurbishment

Radiant Comfort Unit Solution Platform



- Hybrid solution:
 - Combine convection & radiation
- Not necessarily a need to use traditional radiators for heating



Beam presentation



Chilled beam Solutions for Hospitals



- Hygienic solution:
 - Easy to clean
 - Antibacterial copper to copper coil
 - No condensation



Chilled beam Solutions for Hospitals



Swirl Comfort Unit Solution



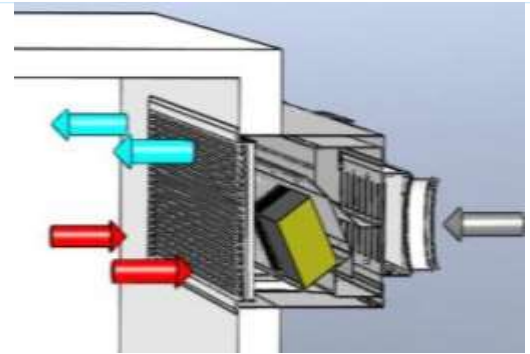
- Designed for low energy buildings
- Room cooling capacity 30 - 70 W/m².
- 360° swirl air diffusion:
 - Excellent mixing
 - Stronger coanda effect (jet stays attached to the ceiling longer distance)
 - Low velocities in occupied zone
 - Short throw pattern makes easier to locate it into the space

Chilled beam Solution for apartments



- Excellent indoor conditions:
 - Desired thermal conditions
 - Good indoor air quality
 - Individual conditions
- Low energy consumption:
 - Air-water system
 - Moderate airflow rate
 - High temperature cooling system
 - Low temperature heating system
 - Demand-based ventilation

Special solutions Helsinki University - Finland



Meeting room



Office

Chilled Beam Solution for hotels



Boost function

- Provides desired guest comfort and react to changes in occupancy
- Fast change of hotel guest room temperature.

Comfort

- Guest room air heating and cooling control
- Individual room temperature setpoint adjustment
- Fast boost operation with time limit
- Panel screen brightness automatically adapts to room ambient light level.

Energy

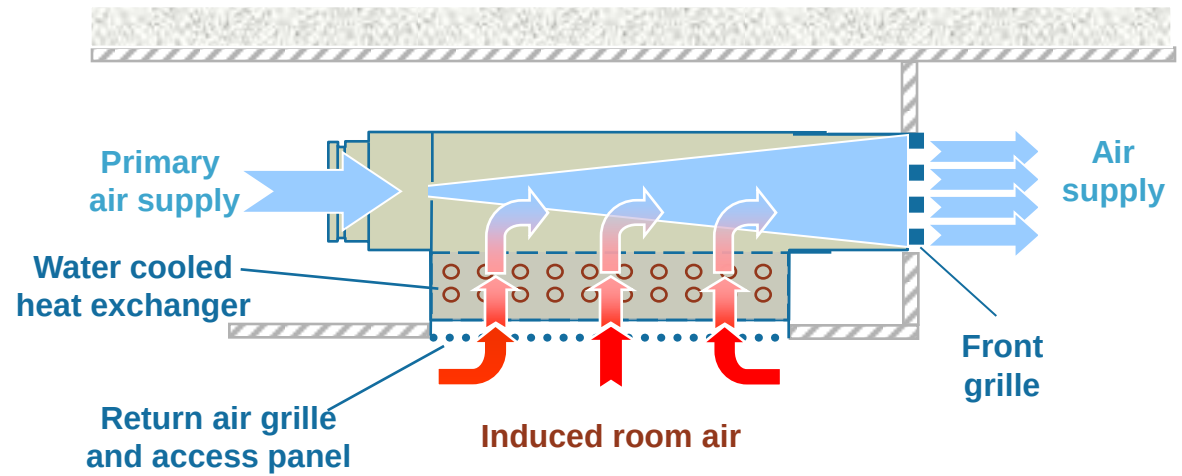
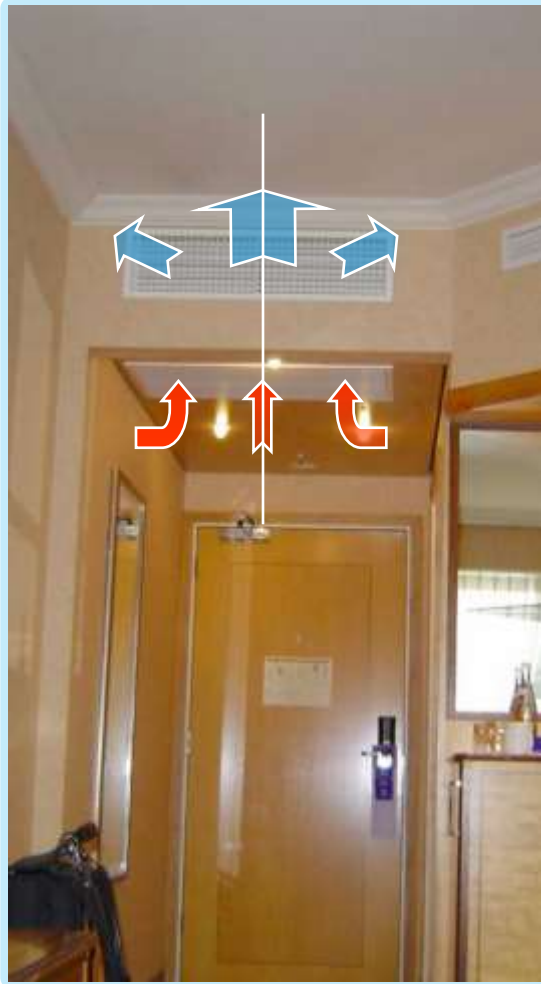
- Occupancy control with network connection and room keycard reader (option)
- Reduced airflow, heating and cooling when not occupied (option)

Safety

- Condense prevention with coil condense sensor (option)
- Monitoring of room conditions via bus communication
- Pre-installed and factory tested unit



Halton CHH – Hotel beam



Case study: 300 rooms, 20-year life cycle

Fan coils:

Filter change	€25/filter twice a year	€ 300.000
	15 min to replace @ €20/hr	€ 60.000
Cleaning of condensation system:	3 times/year @ 15 min	€ 90.000
Motor replacement:	€200 / motor	€ 60.000
	2 h work @ €20/hr	€ 12.000
<u>Fan coil replacement</u>	<u>€ 1000/ unit</u>	<u>€ 150.000</u>

Total € 672.000

Chilled beams:

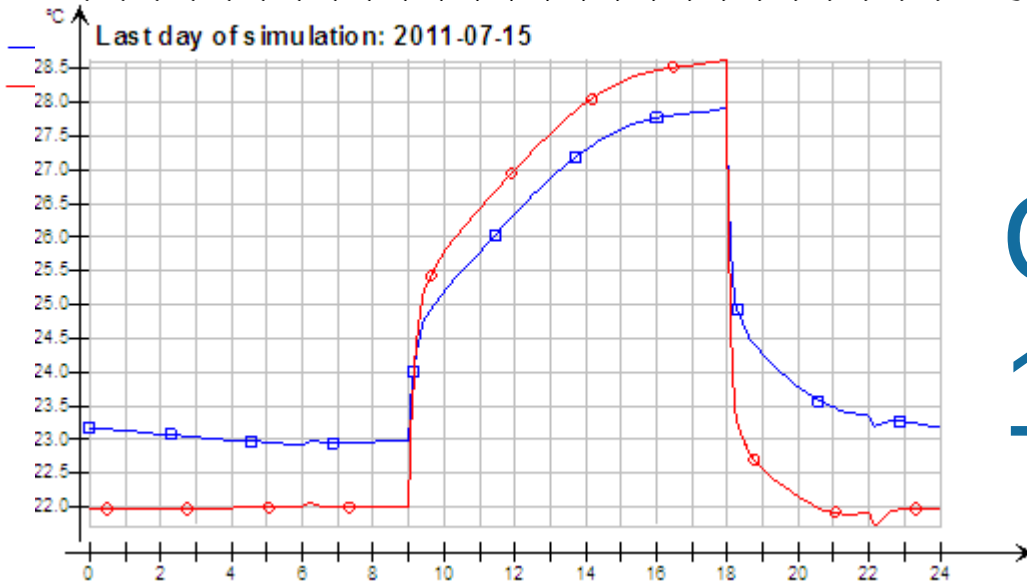
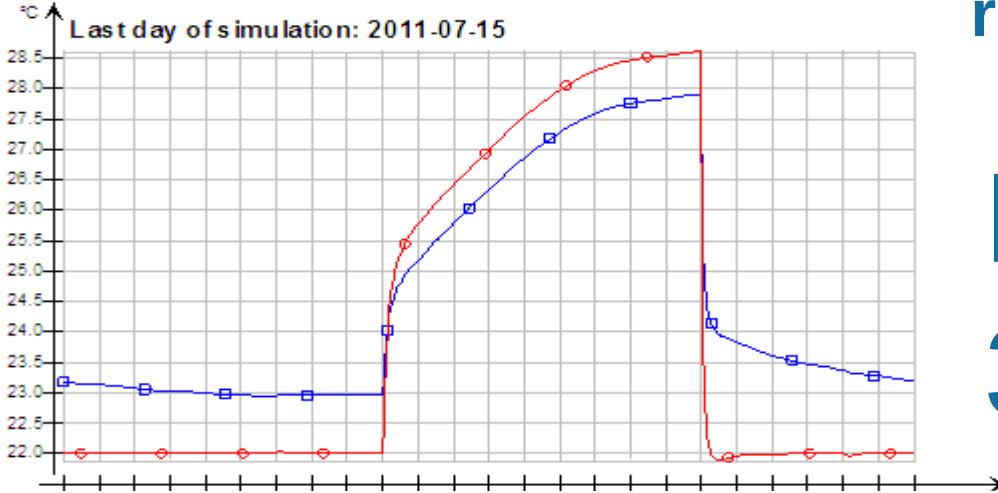
Cleaning of chilled beam once in every year á 30 min @ €20/hr	€ 60.000
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Difference in maintenance and replacement costs € 612.000

Beam system is slow to react?

FanCoil
3kW

Chilled Beam
1.2kW



UNITÉ TERMINALE VENTILÉE

Inducteurs extra-plats 80 mm - Haute induction

NOUVEAU



- Faible épaisseur (8cm)
- Particulièrement adapté à la rénovation
- Détramage des terminaux et nombre d'appareils moins important
- Possibilité de cloisonnement entre 2 appareils

Three levels of chilled beam systems

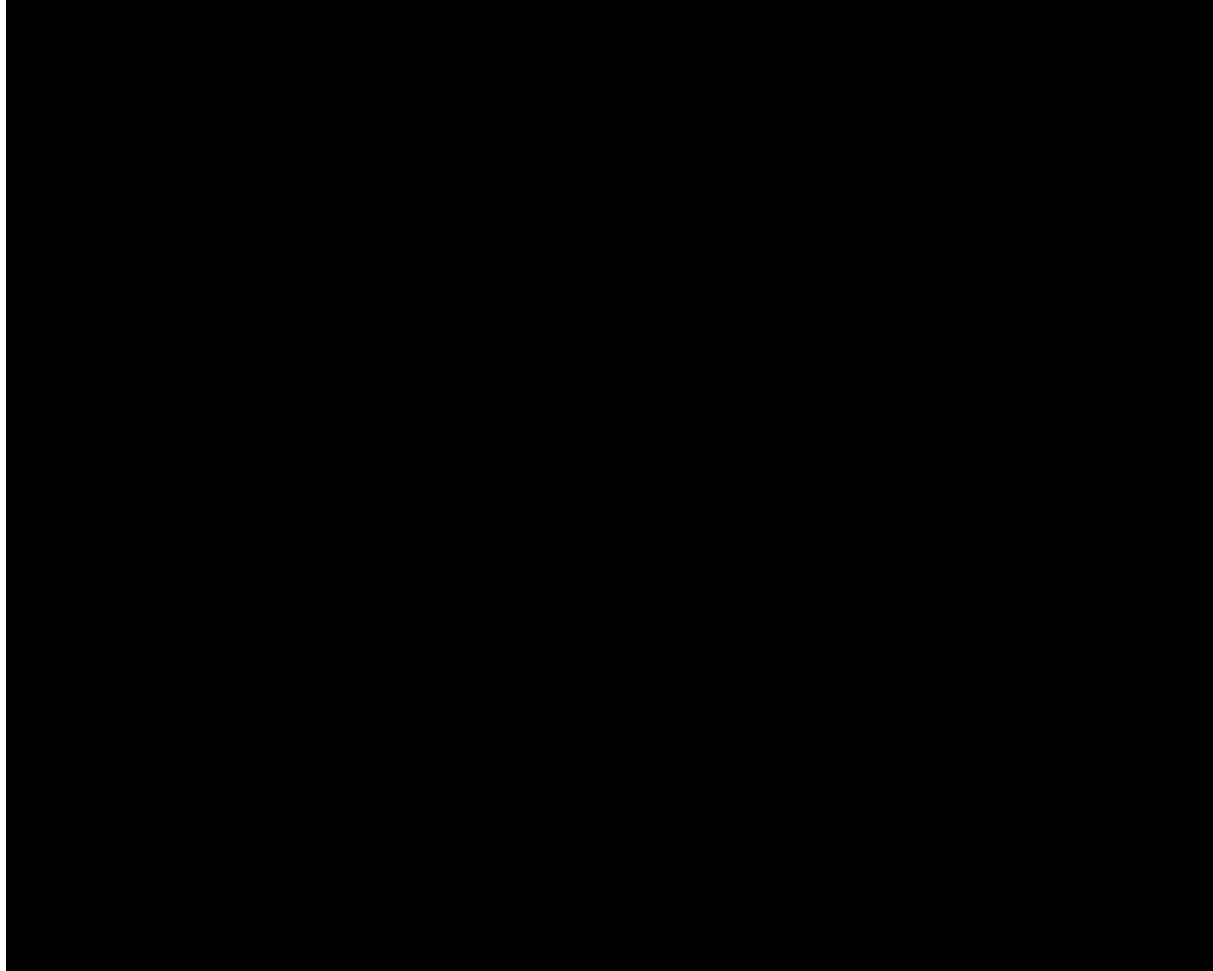
- Basic – CAV system where temperature managed through water valve
- Adaptable – CAV for office and VAV beam for meeting rooms
- Vario – All beams with full VAV function
- All Halton beams are Eurovent certified



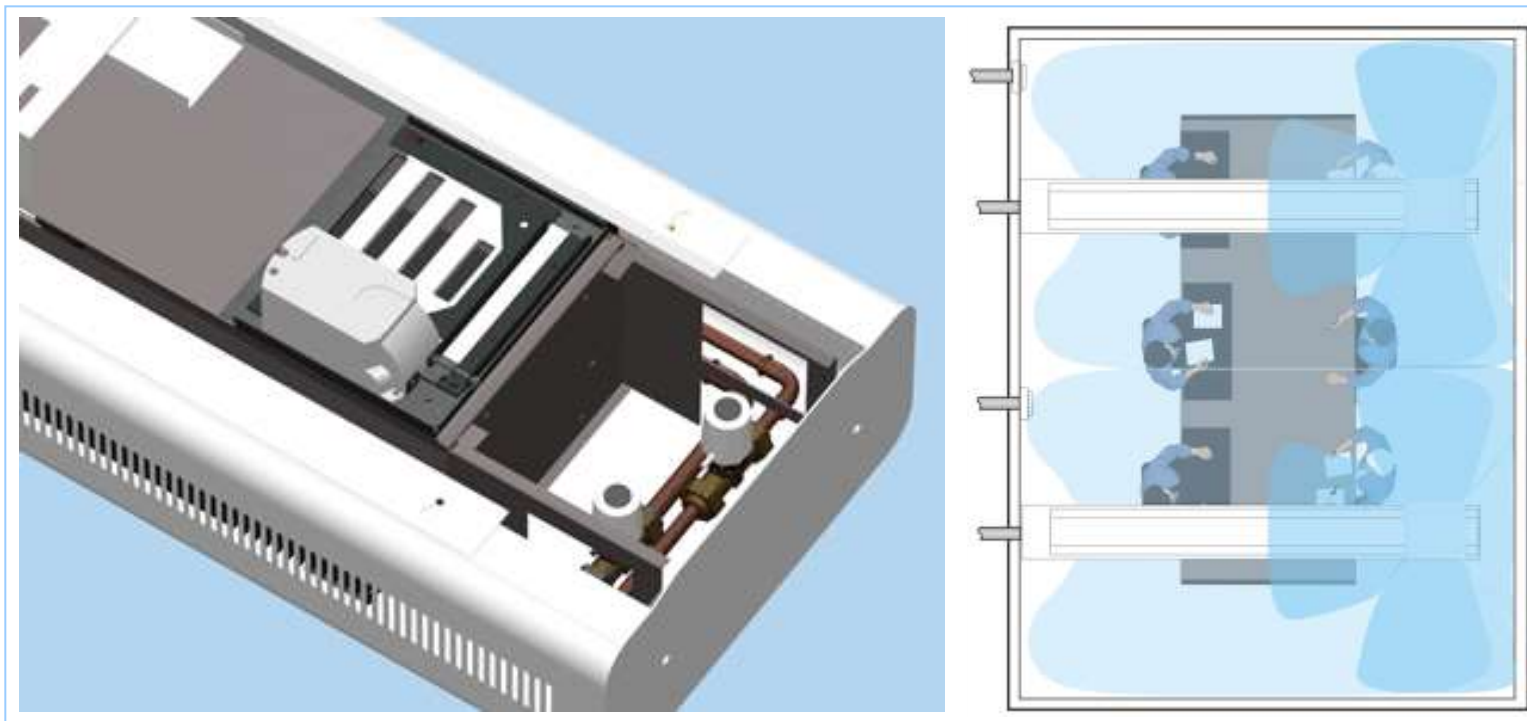
Halton Adaptable^{Climate} —

Beam
presentation

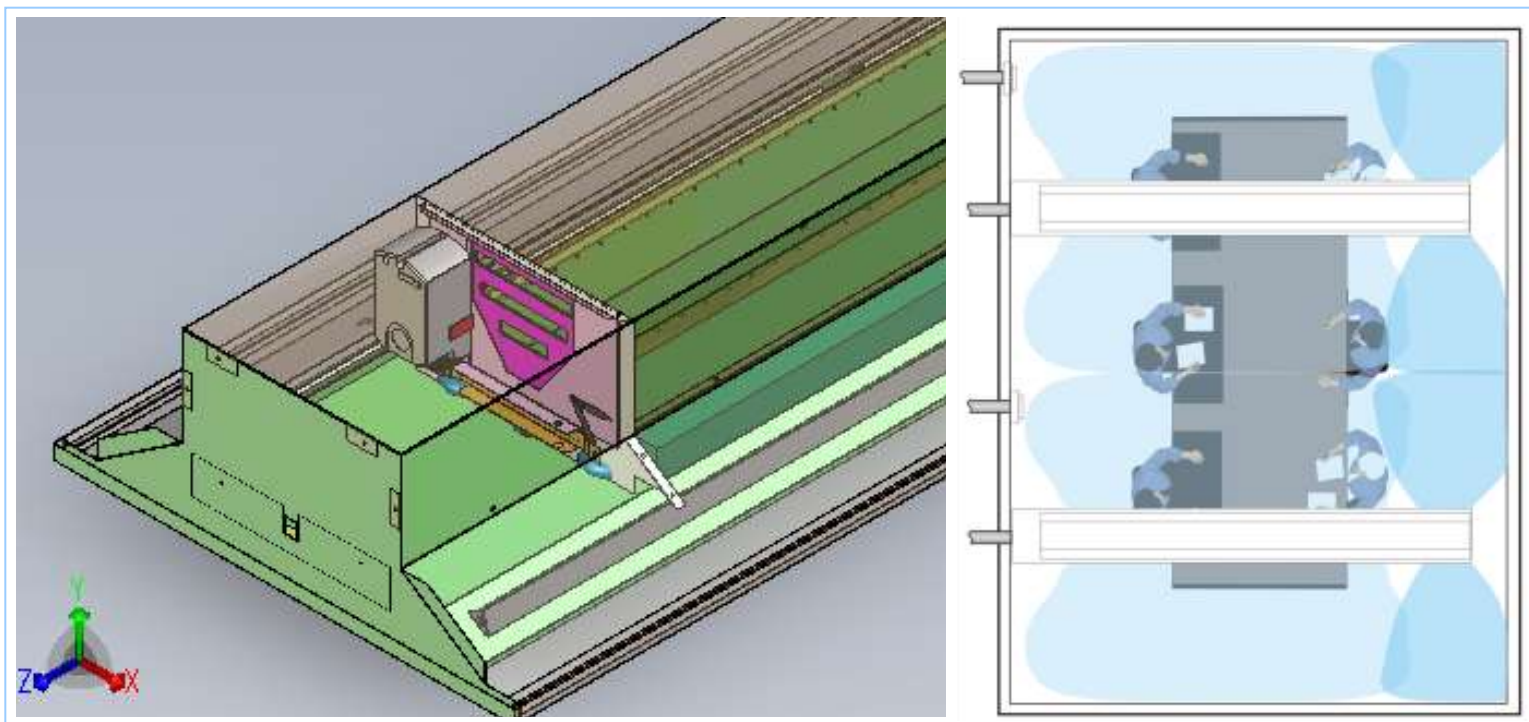
From open-plan offices to office rooms



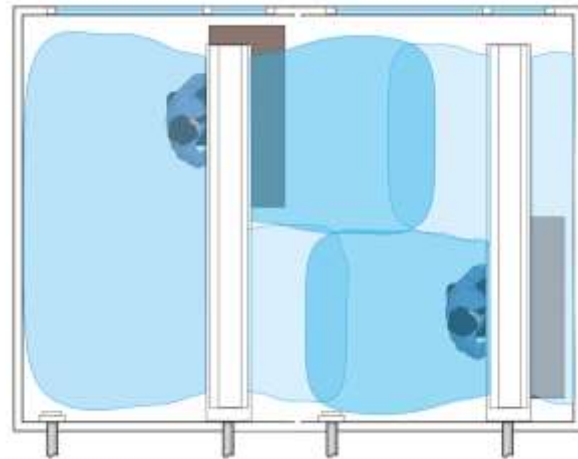
Halton Air Quality Control in exposed installation



Halton Air Quality Control integrated installation

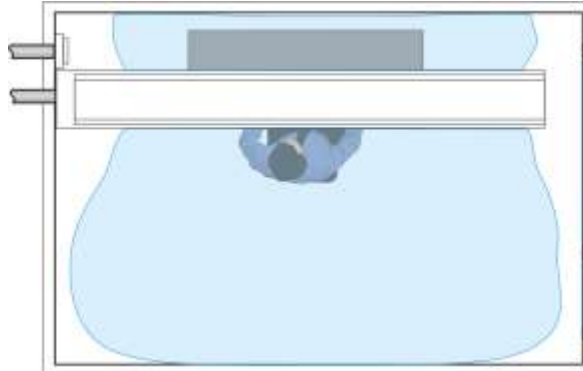


Halton Velocity Control for enhanced thermal comfort



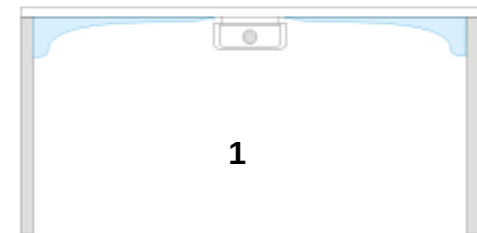
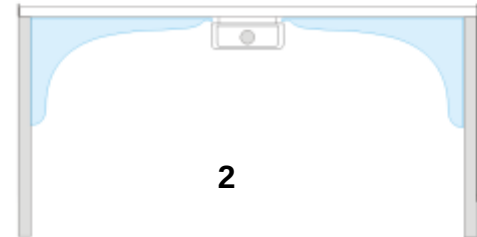
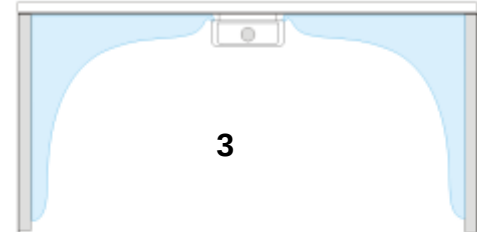
Primary air represents only about 25% of the air circulating in the room. Adjusting amount of induced air affects the thermal comfort effectively:

Left: controlling thermal conditions in an open-plan office



Right: Velocity patterns with different HVC positions

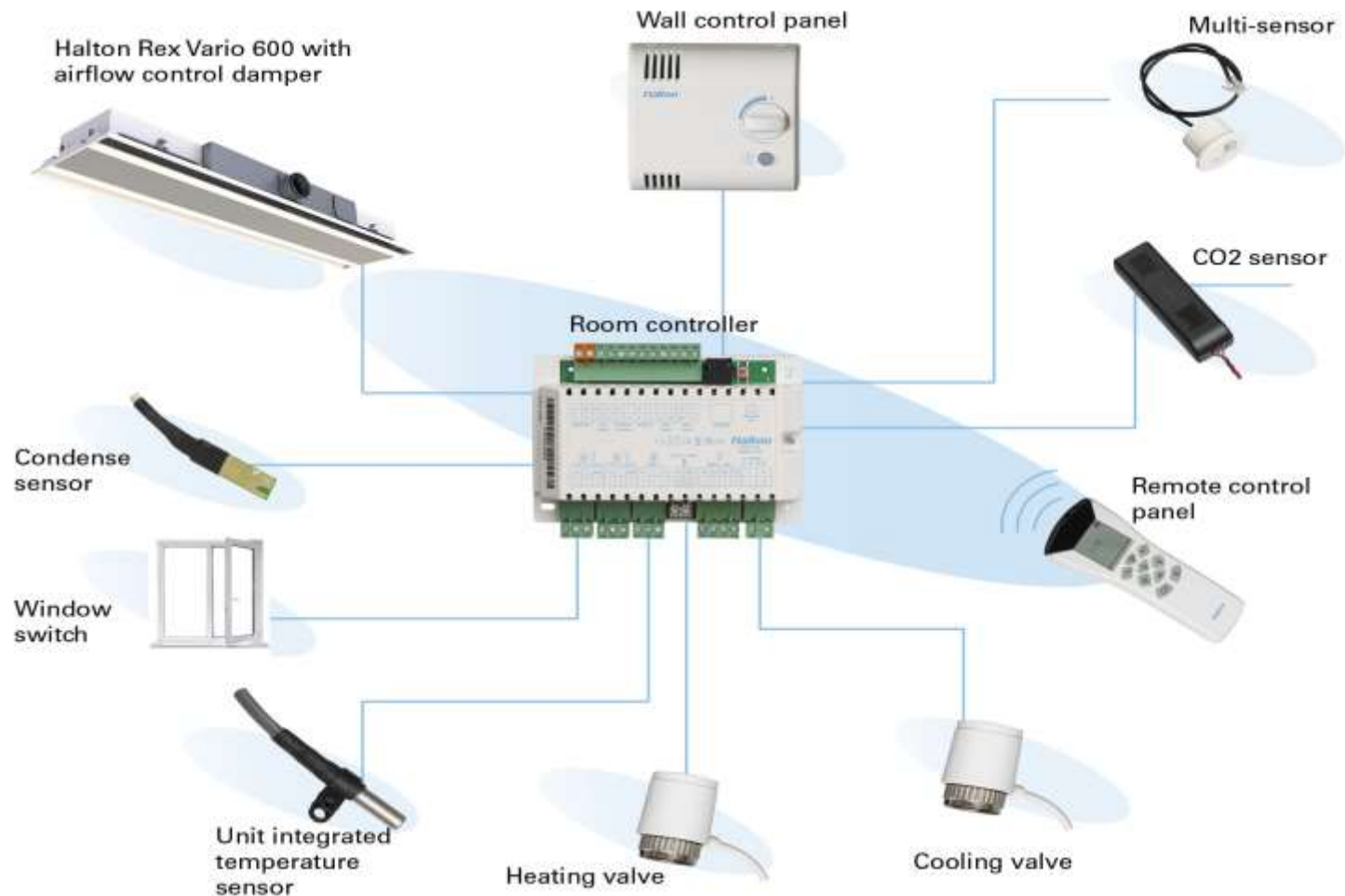
Left: controlling thermal conditions in an office room, where partition wall is relocated





The fully flexible, total solution for green buildings

Rooms with air-water system

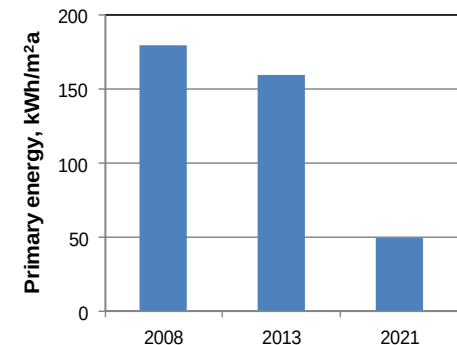
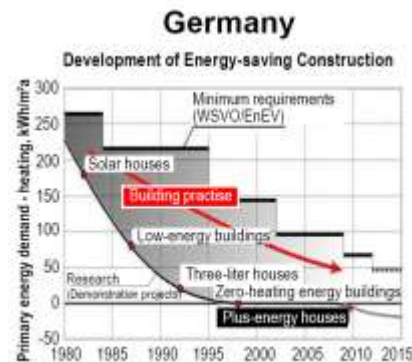
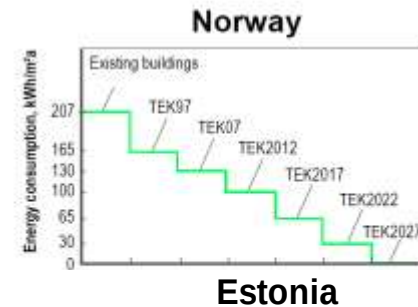
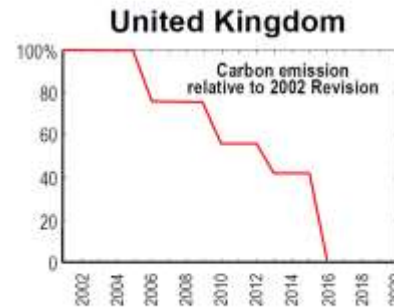
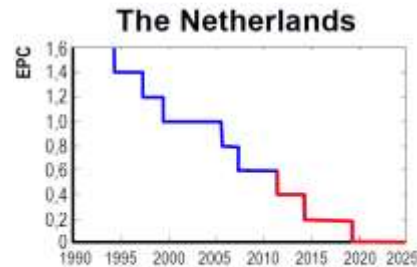


Indoor climate solutions make a significant
environmental impact on the move towards
NZEBs

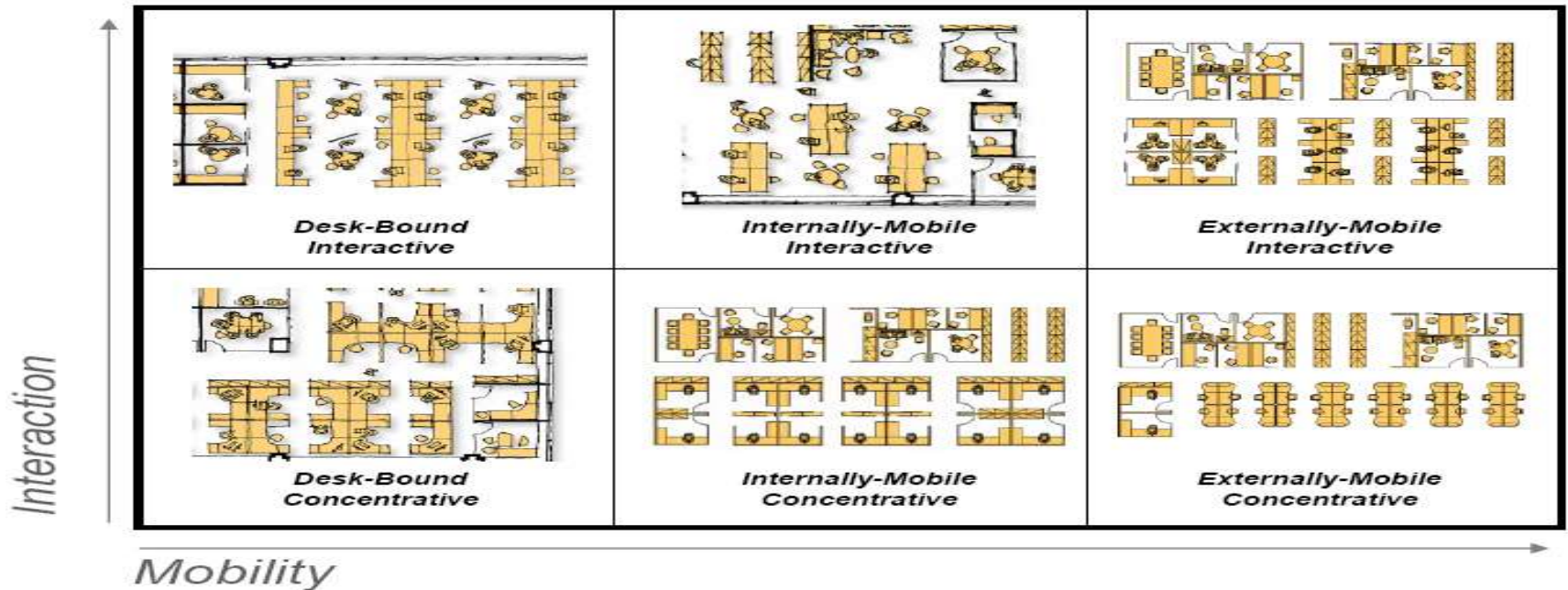


Towards NZEBs:

- Roadmap of some countries towards nearly zero energy buildings to improve energy performance of new buildings
- Many countries have prepared long term roadmaps with detailed targets
- Helps industry to prepare/commit to the targets



Work places according to Interaction and mobility demands



Office work is changing: churn ratio of layout is very high. Spaces should be adaptable to new situations without high churn costs.

Survey results: 30-40% seat occupancy

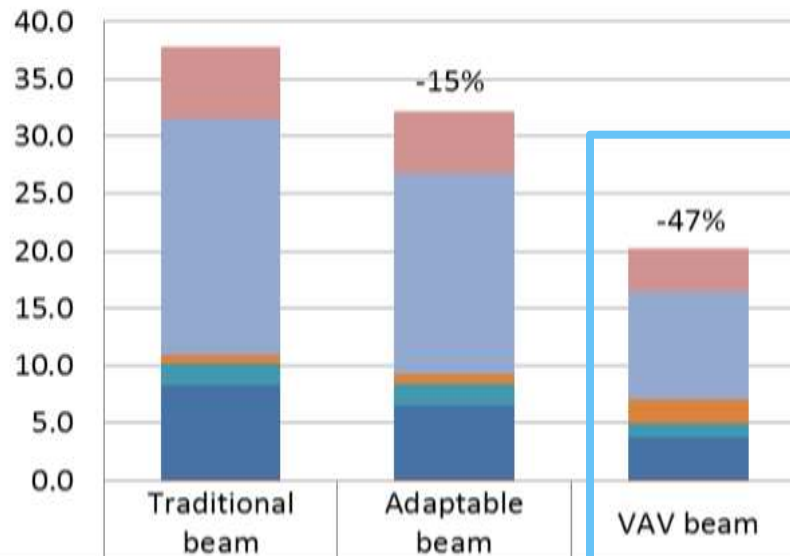


A lot of effort is put into estimating properties of the building elements and adjusting the systems to the building related prerequisites and constraints, less effort is spent on considerations regarding the users and their activities.

There's a difference between a chilled beam and a chilled beam

**Delivered energy consumption, kWh/m²,a
Stockholm**

**Results of a
energy
simulations:**



**Fully flexible
operation for up
to 50% energy
savings
traditional
beams.**

Heating of spaces	6.3	5.4	3.7
Heating of ventilation	20.5	17.5	9.5
Cooling of spaces	0.8	0.9	2.1
Cooling of ventilation	1.9	1.9	1.2
Fan energy	8.2	6.5	3.7
Pumping	0.1	0.1	0.1

Halton Vario contribution towards LEED: Case Neptun

Category	Points	Max. Points	%-share
Sustainable sites	23	28	82 %
Water efficiency	10	10	100 %
Energy & Atmosphere	31	37	84 %
Material & Resources	5	13	38 %
Indoor Environmental Quality	9	12	75 %
Innovation	6	6	100 %
Regional Priority	4	4	100 %
TOTAL	88	110	80 %

Note: Energy use 21 of max. /21 points

“Skanska has chosen many energy efficient solutions which enable superior air quality maintenance in the Neptun office building situated in Helsinki Finland. With Halton Vario these qualities can be achieved cost efficiently and it's easy to control the changes in the indoor environment.

Pellervo Matilainen,
Design Manager, Skanska Oy



Beam presentation

Halton Vario: Promise

50%

Halton Vario is up to 50% more efficient than traditional air –

15MIN

Radically lower fit-out costs as offices can be converted in

A- CLASS

Halton Vario provides A class indoor environment quality that is specified in regular cited international standards (ISO EN 7730, EN 15251 and CR 1752)

Halton Vario in Brief

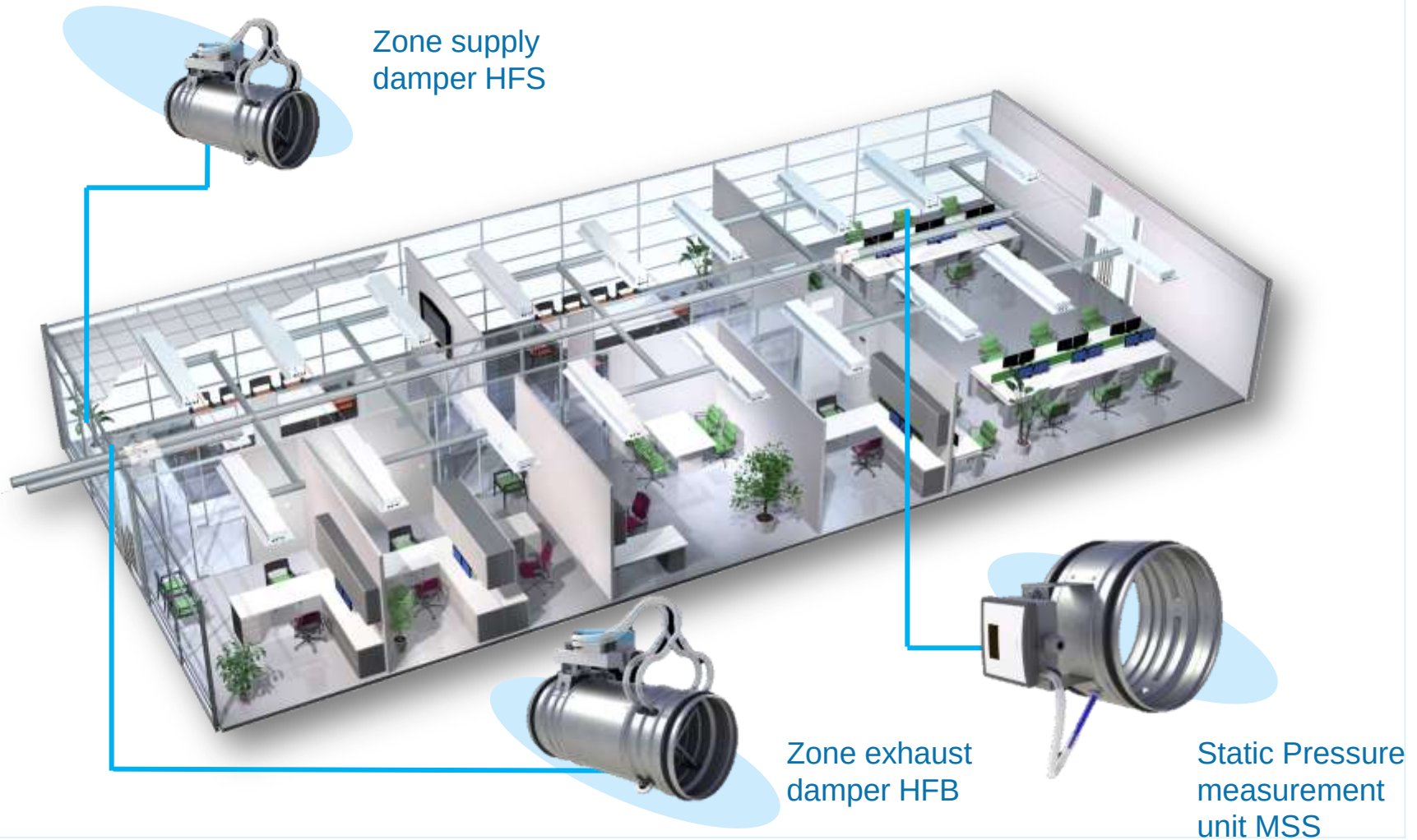
- **Halton Vario is a total indoor climate solution:**
 - Room, zone and central level systems
 - In room level air-water, all –air options or a combination of both
 - Halton Design Studio, Halton Tune and Halton Life Cycle services
- **Halton Vario makes green buildings a reality:**
 - More energy efficient
 - More flexible to changes
 - More comfortable to work in





**Nantex office building
in France equipped
with Halton Vario.**

Flexible ventilation with constant pressure zones





Decision to
build

Target-
setting

Virtual testing of
indoor climate
concepts

Decision on
indoor climate
concept

Full-scale
testing of
solution

**Evaluation
of results
and final
adjustments**

Testing of designs: Virtual and physical simulations

Halton Chilled beams

Beam Installations

Special solutions

Hadid Tower - Italy



Beam presentation



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QAG Mock-Up, Victoria



Devonshire Building, Newcastle



B-Sky-B, Brentford



Shell Tower, South Bank



Standard House, EC1



The Eye, Holborn

Gee street, UK



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Shell centre, UK



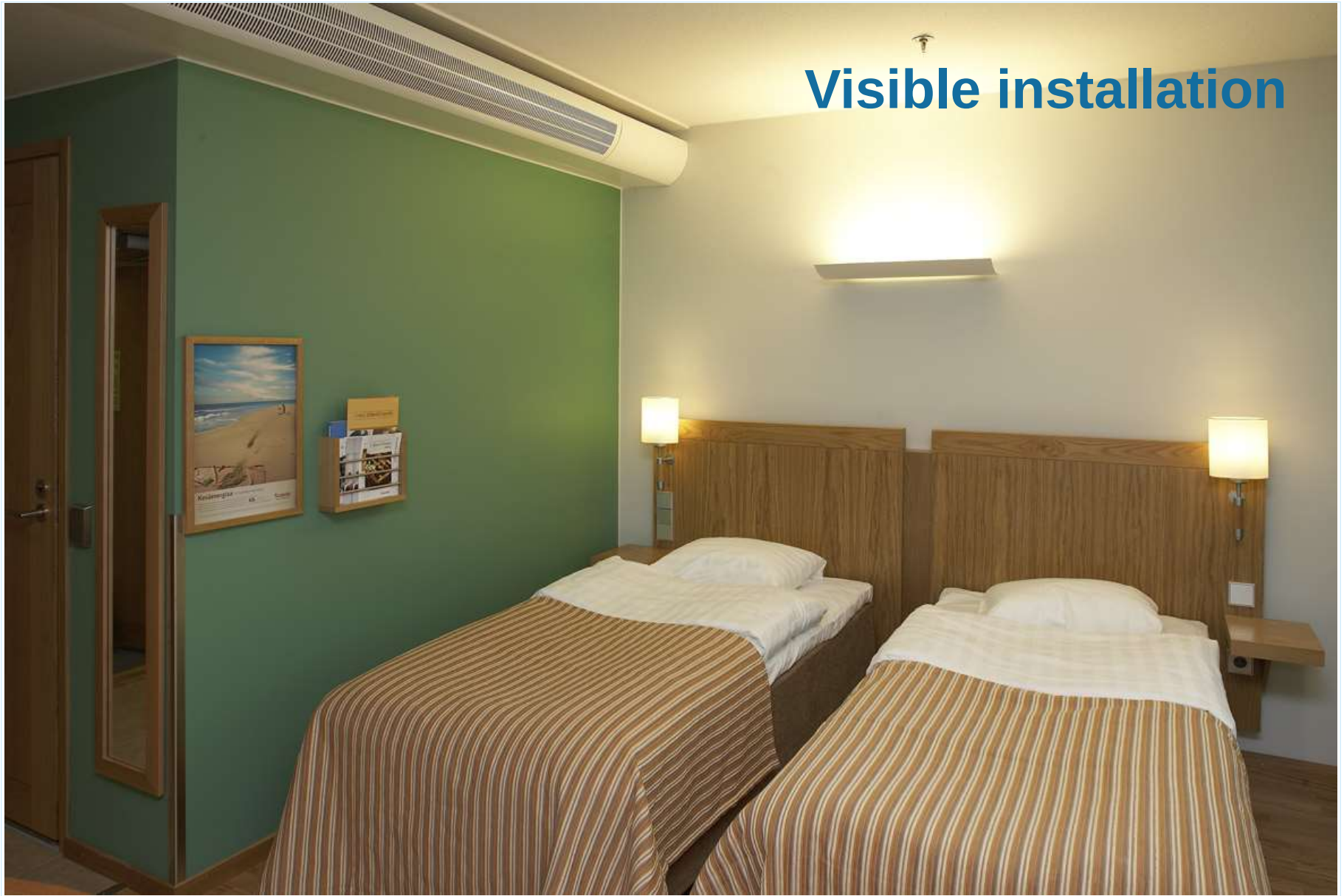
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Imperial College, UK



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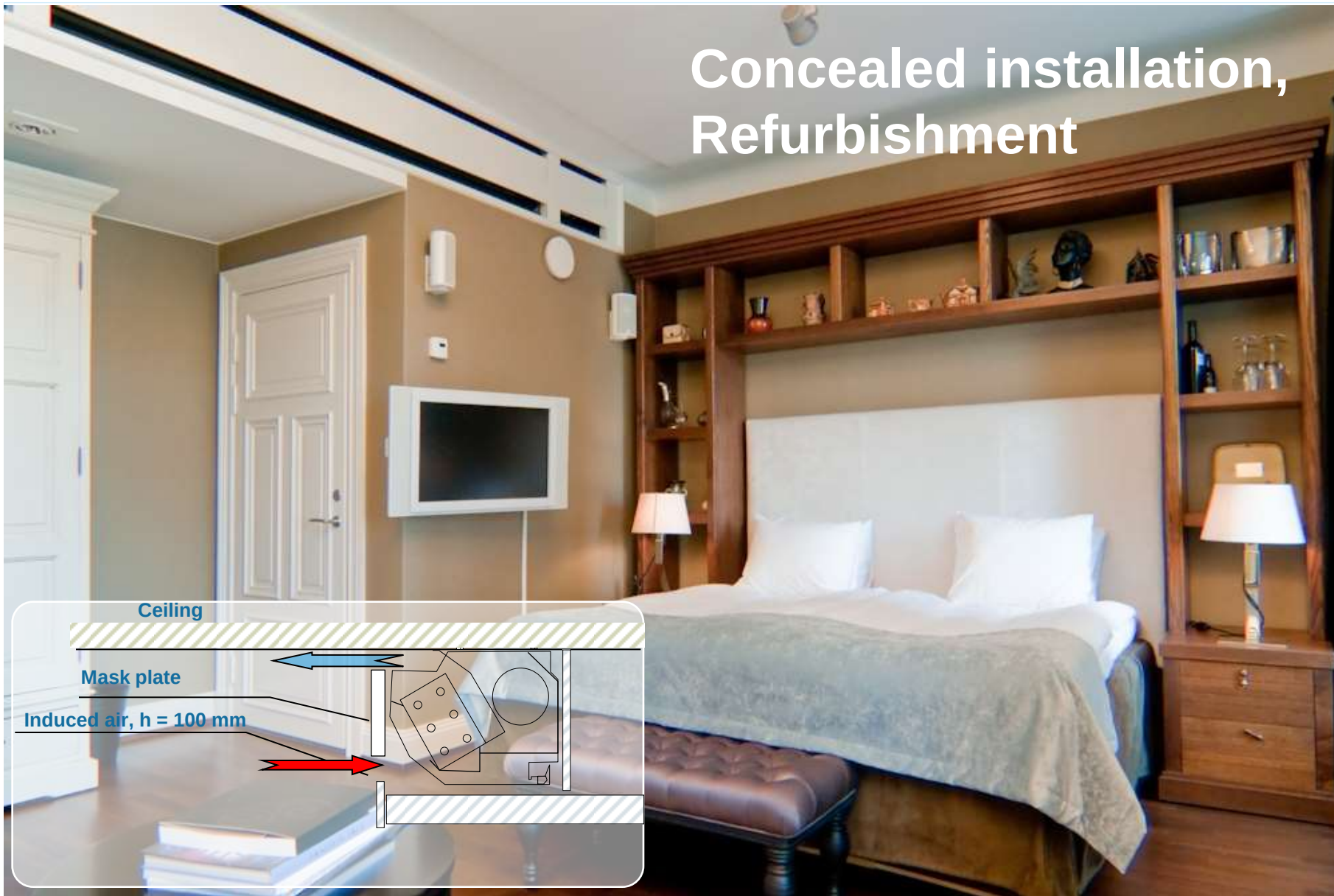
Visible installation



Concealed installation, Refurbishment

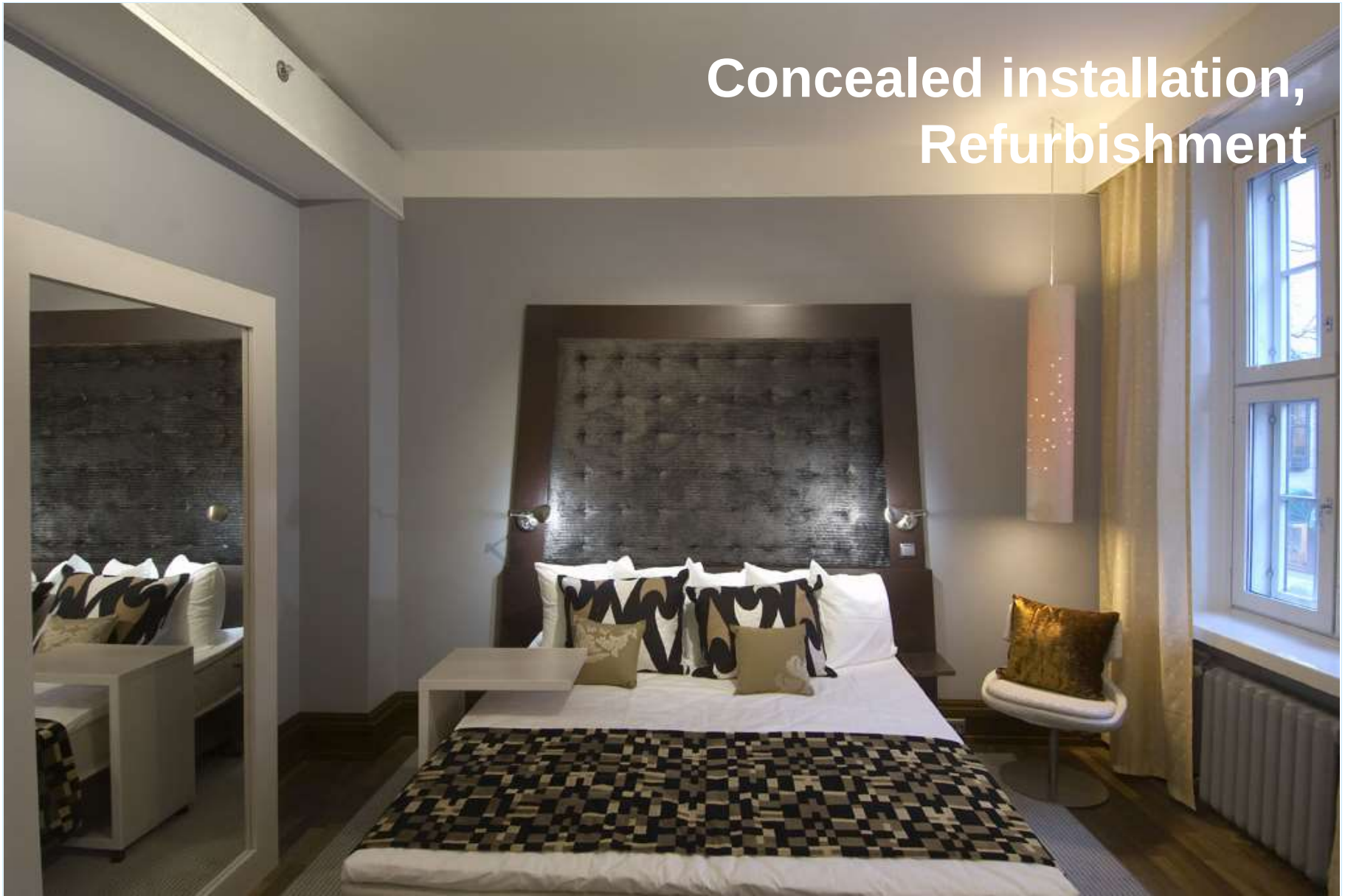


Concealed installation, Refurbishment



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Concealed installation, Refurbishment



Integration with light fittings, Refurbishment



Bulkhead installation





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Halton
INDOORS