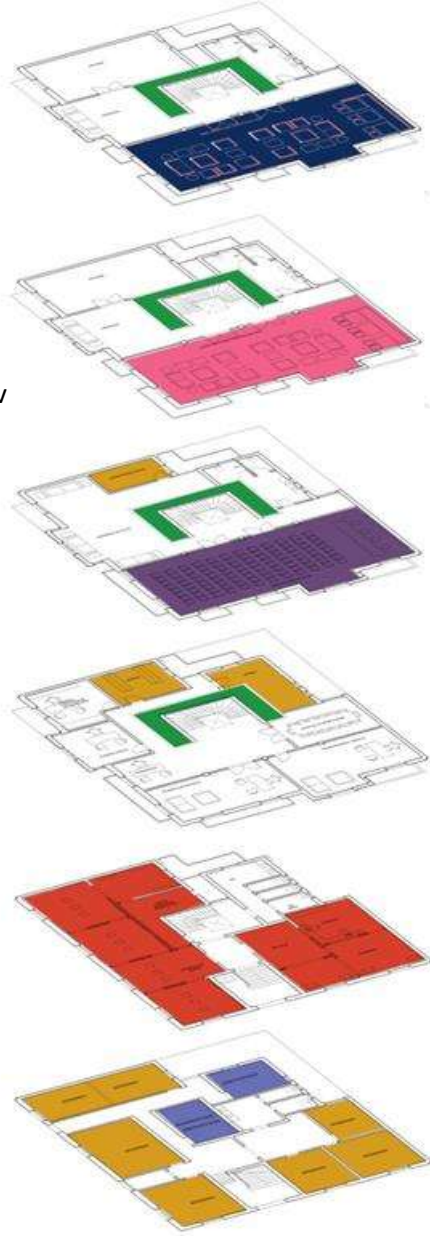




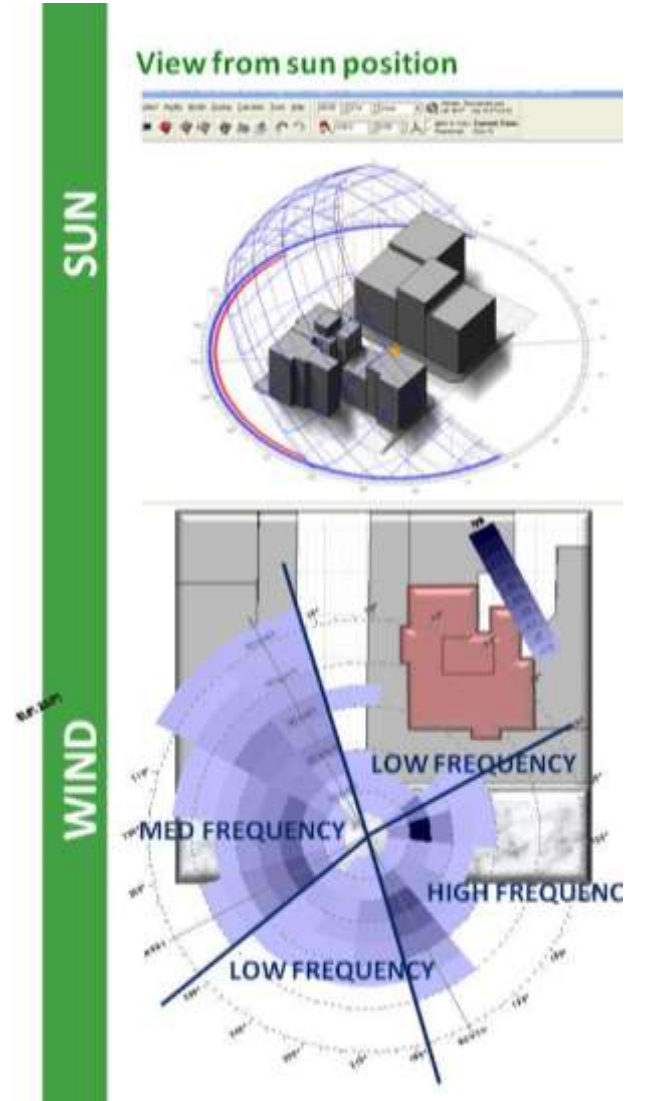
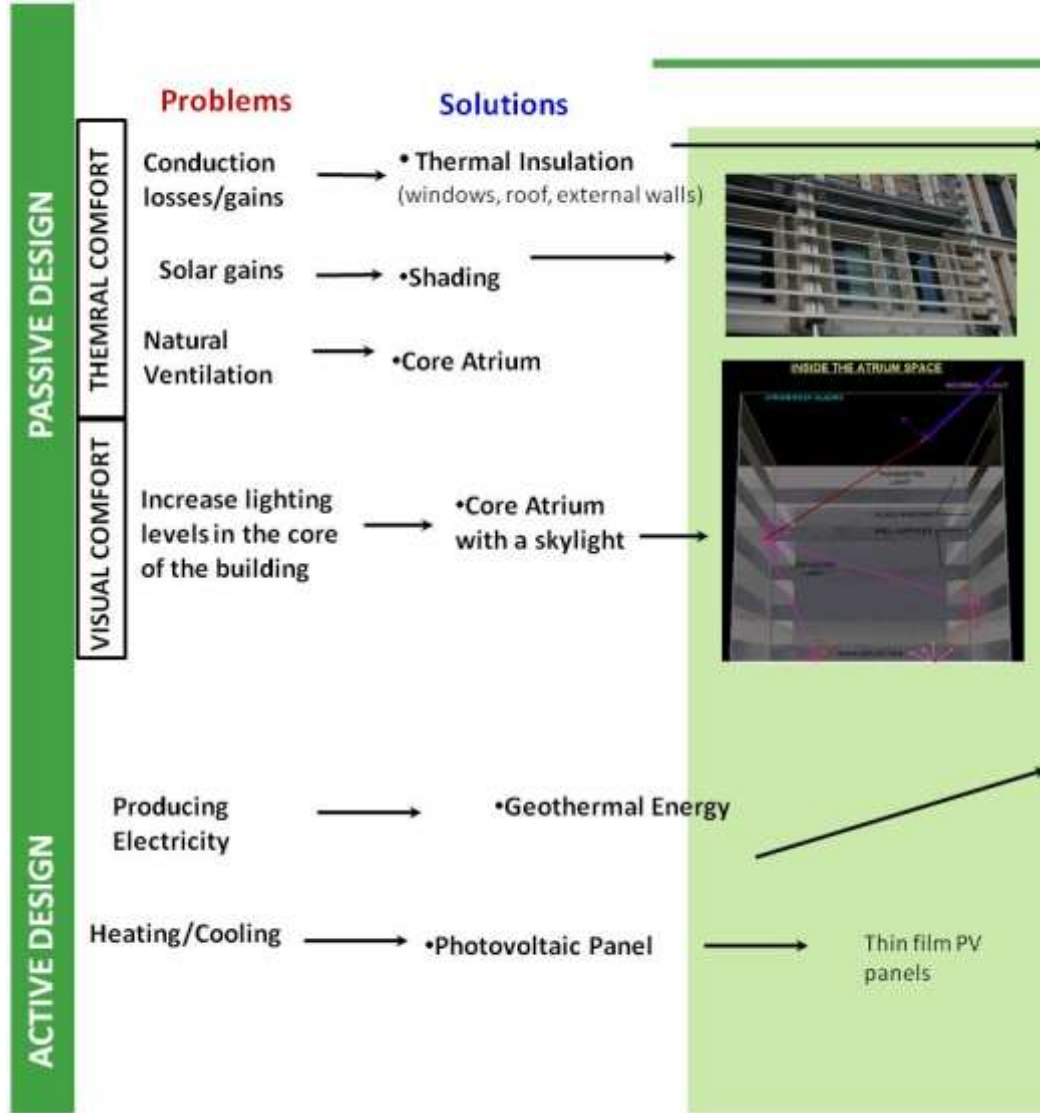
REQUIREMENTS



W6 SUSTAINABLE RENOVATION OF AN EXISTING BUILDING

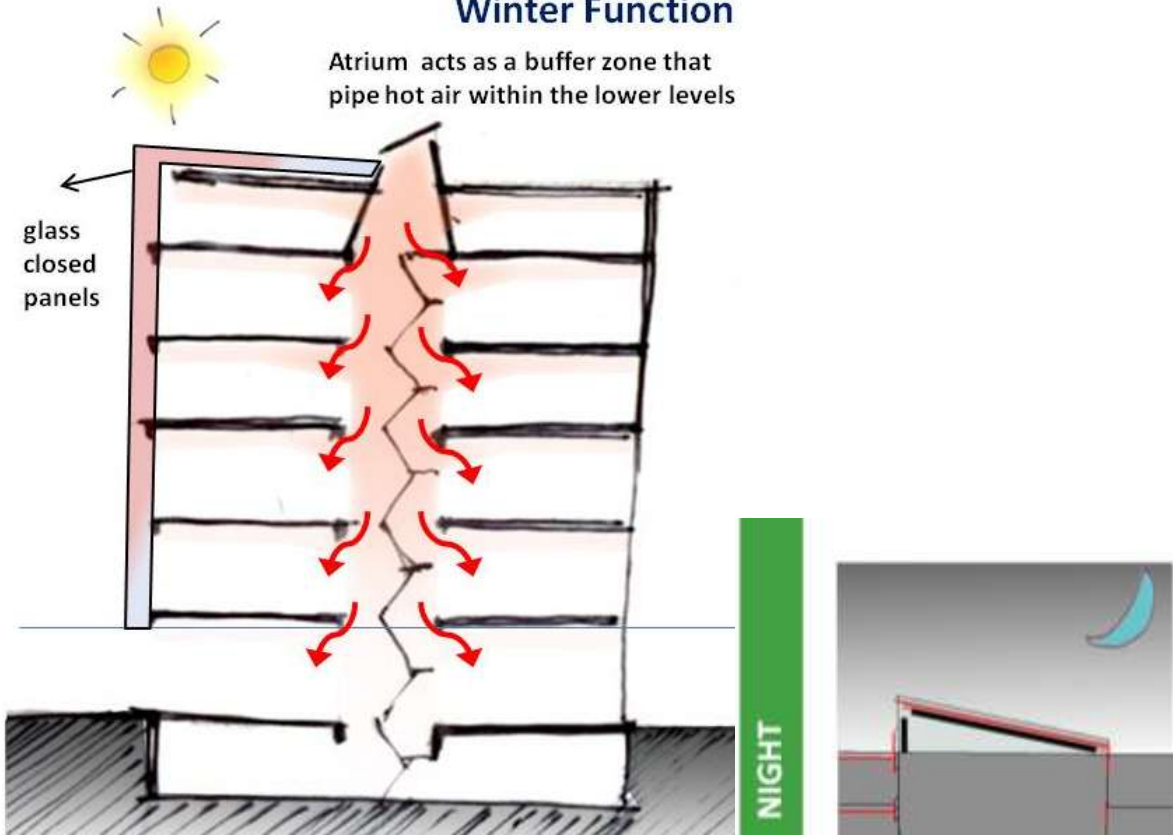


Main Use / Requirements	Temperatures/C°		Metabolic rate/met	Luminance/lux
	Winter	Summer		
Ground Level : Temporary Exhibition	19-21	21-23	1.4	200
1st Floor: Offices	21-23	22-24	1.2	300-500
2nd Floor: Multi-Purpose Hall	19-21	21-23	1.4	300-500
3rd Floor: Library	19-21	21-23	1.4	300-500
4th Floor: Professor's Club	19-21	21-23	1.4	300-500
Extension : Cafe-Restaurant	20-22	22-24	1.3	100-200



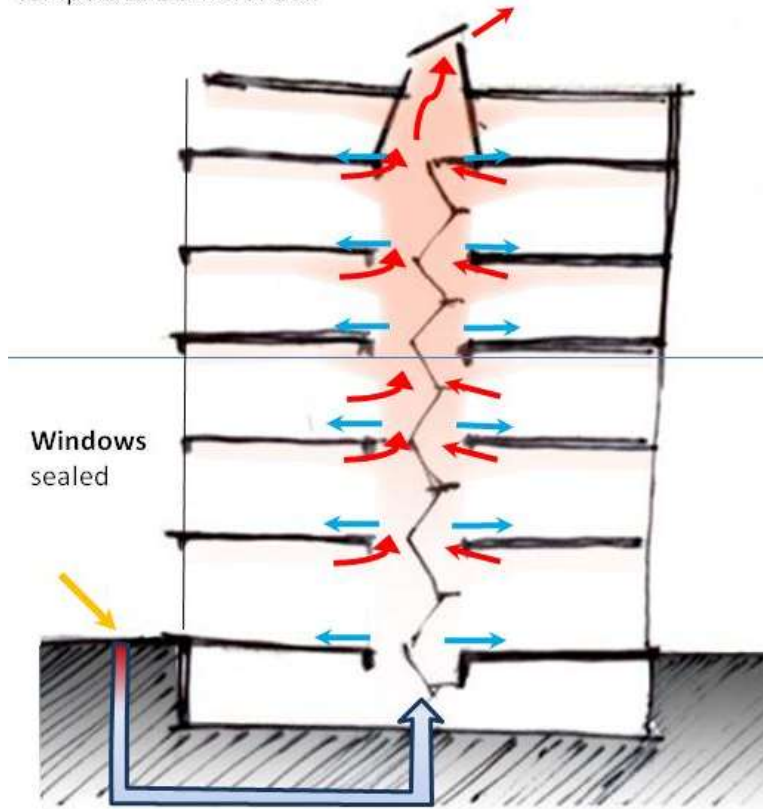
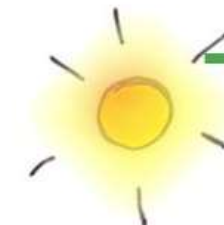
Winter Function

Atrium acts as a buffer zone that traps hot air within the lower levels



DAY

Convection based on stack effect
High internal gains and the glazed atrium naturally stratify the air within the atrium creating a vertical temperature differential.



Outlet: at the highest point of the atrium
Inlet: through ducts placed underground

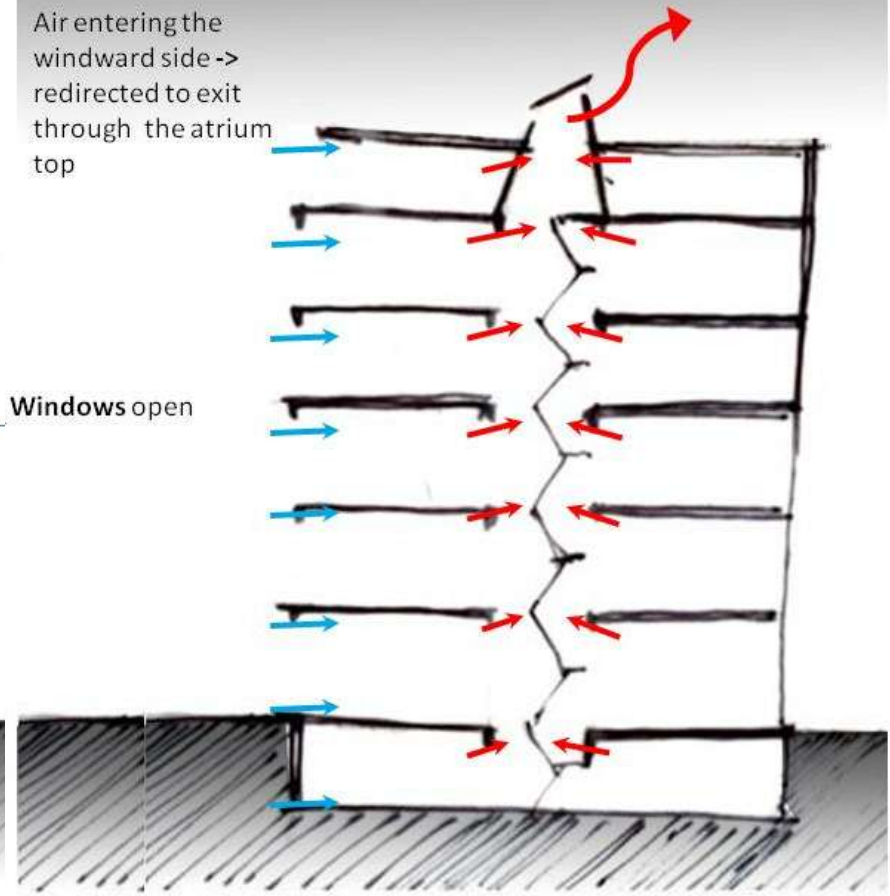
GROUND TEMPERED VENTILATION

NIGHT

Prevailing wind

Air entering the windward side -> redirected to exit through the atrium top

Windows open



Outlet: at the highest point of the atrium + on the leeward side
Inlet: at the windward side facing directly on the prevailing wind.

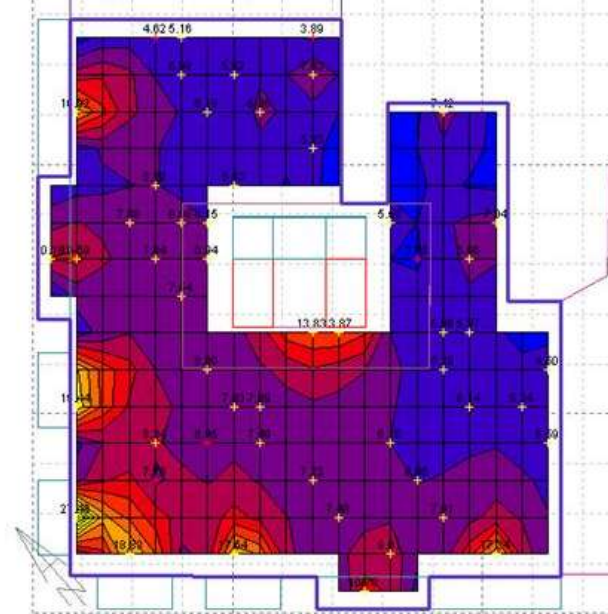
NIGHT TIME VENTILATION – HIGH THERMAL MASS

2 glass panels are applied on the façade and are connected with the atrium in order to provide hot conditioned air within the building.



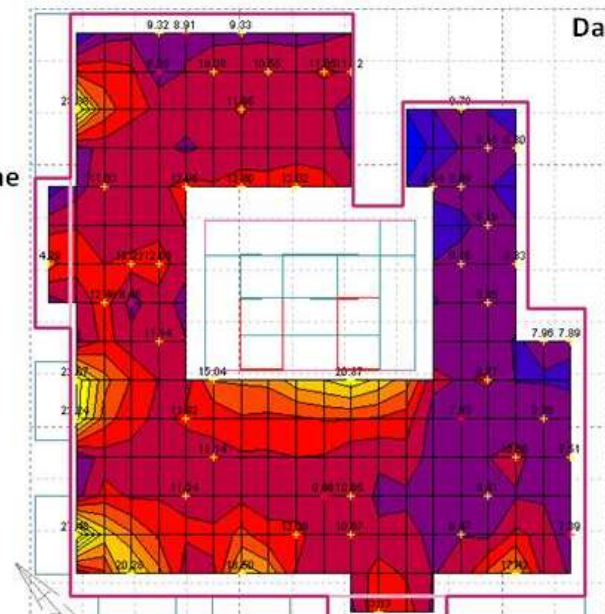
DAY

Daylight Analysis



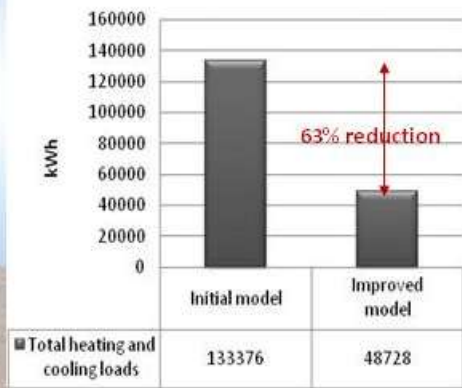
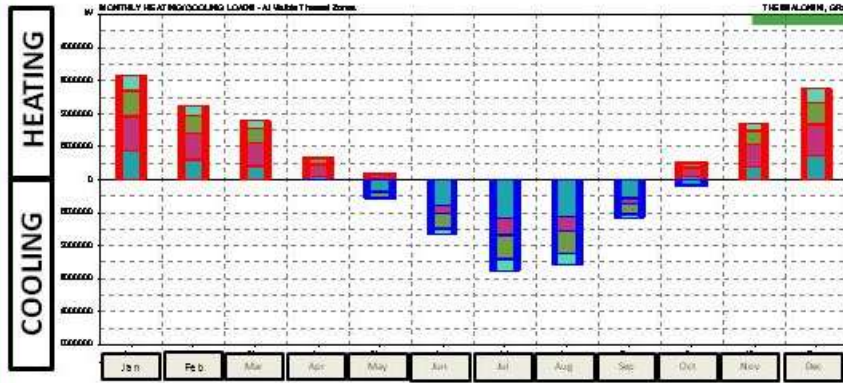
Lighting levels are increased. The daylight factor is more even distributed within the space.

Daylight factor



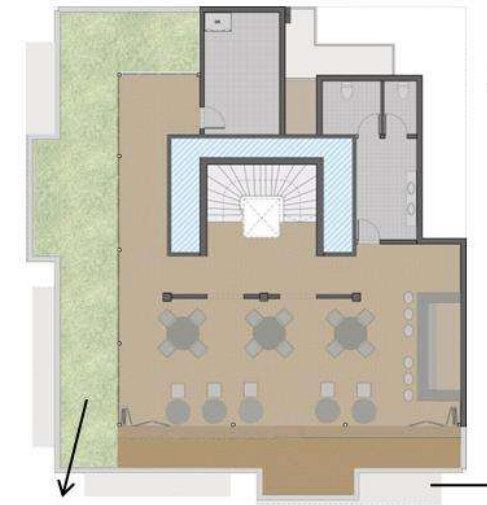
PV potential

Energy(W h)	=	Incident Solar Radiation(W h)	*	Conversion Factor
	=	1463739 (W h)	*	0.10
	=	1781024 (W h)		



Change of materials properties		
	U values	
	Initial model	Improved model
External walls	1.77	0.150
Roof top	7	0.150
Windows	5.1	2.21

ROOF EXTENSION



Green Roof

Over the glass roof are applied 140 m² shading devices with a thin film PV covering. The system can potentially provide 1781 kWh annually almost

PLAN

PV PANELS

