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DESIGNING AND LIVING IN A MEDITERRANEAN ACTIVE HOUSE:

FIRST ASSESSMENT ON CLIMATE AND USERS IMPACT ON ENERGY AND INDOOR COMFORT

Webinar 24 September 2014

Guest speaker: Ing Arianna Brambilla, Department A.B.C., Politecnico di Milano

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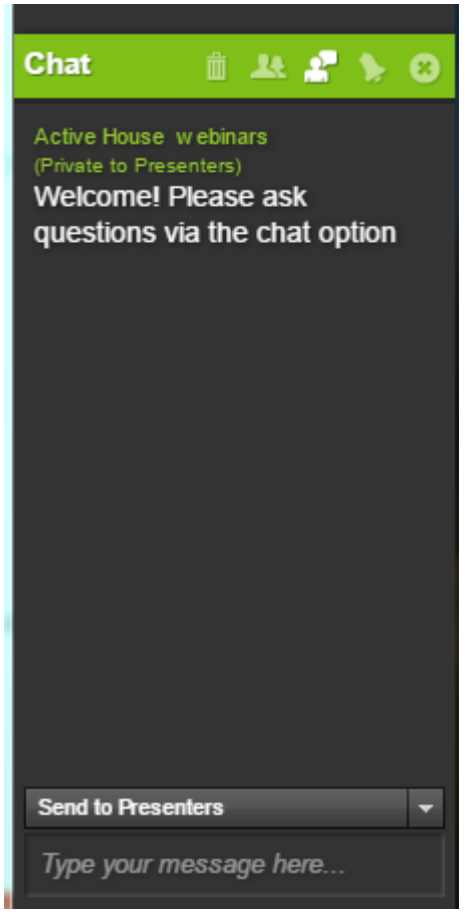
Welcome –
Practical information

- Please ***mute*** your telephone.
- Use the chat to ask questions.
- The host will read them and moderate the Q&A session



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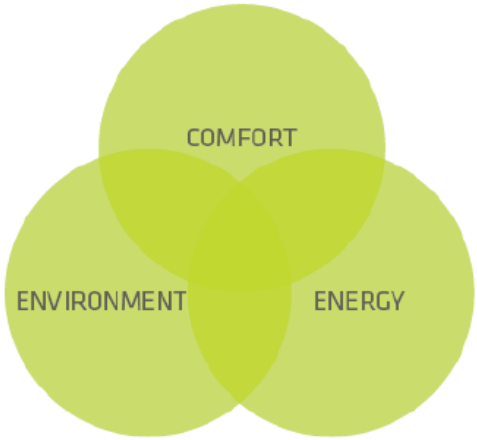
Active House Vision

- buildings that gives more than they take

Active House is a vision of buildings that create healthier and more comfortable lives for their occupants without impacting negatively on the climate



Comfort

– *creates a healthier and more comfortable life*

An Active House creates healthier and more comfortable indoor conditions for the occupants, ensuring a generous supply of daylight and fresh air. Materials used have a neutral impact on comfort and indoor climate.

Energy

– *contributes positively to the energy balance of the building*

An Active House is energy efficient. All energy needed is supplied by renewable energy sources integrated in the building or from the nearby collective energy system and electricity grid.

Environment

– *has a positive impact on the environment*

An Active House interacts positively with the environment through an optimised relationship with the local context, focused use of resources, and its overall environmental impact throughout its life cycle.

Agenda

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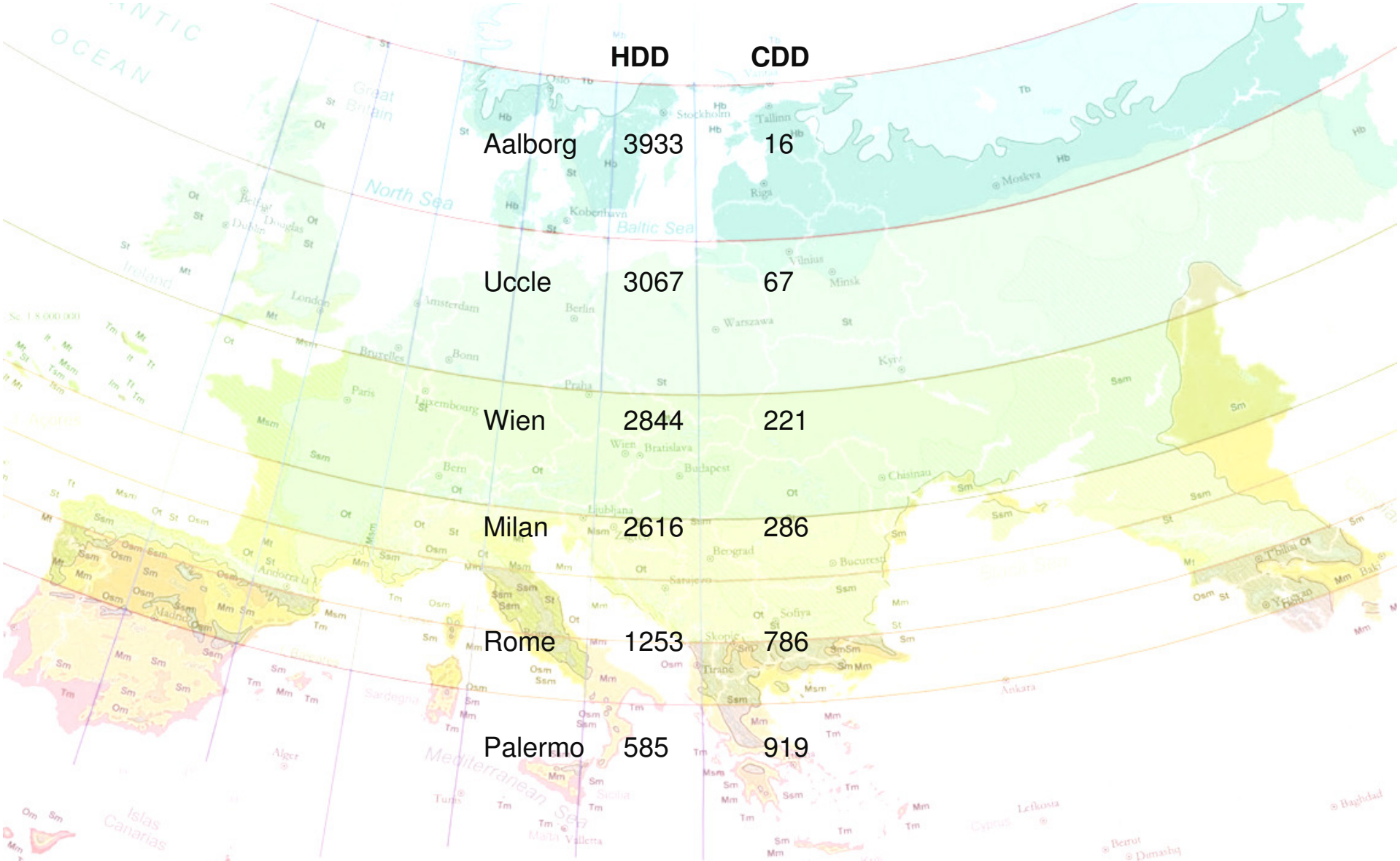
Objective of the webinar:

A Mediterranean Active House is taken as an example for testing the robustness of the solution in three different Italian cities: Palermo, Rome and Milan, from a very hot climate to a more continental one. Moreover every project must be evaluated taking into considerations the climatic, social, economic and cultural aspects, and it must be able to guarantee the optimal performance in every way it could be "used" by the occupant. The aim is to understand the resilience that an Active House could provide according to different users scenarios both from an energy point of view and the indoor comfort.

Program of the webinar:

- Introduction to the webinar: 10 min
- Presentation by Ing Arianna Brambilla (Department A.B.C., Politecnico di Milano): 25 min
- Questions and answers: 25 min



	HDD	CDD
Aalborg	3933	16
Uccle	3067	67
Wien	2844	221
Milan	2616	286
Rome	1253	786
Palermo	585	919

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POLITECNICO DI MILANO
Department ABC

medAH

practical GUIDELINES

for designing and living an Active House in warm climate

VELUX
RhOME for denCity
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AALBORG UNIVERSITET
Danish Building Research Institute AALBORG UNIVERSITY

SENSITIVITY ANALYSIS

Effectivness on energy consumption of the buildings design parameters

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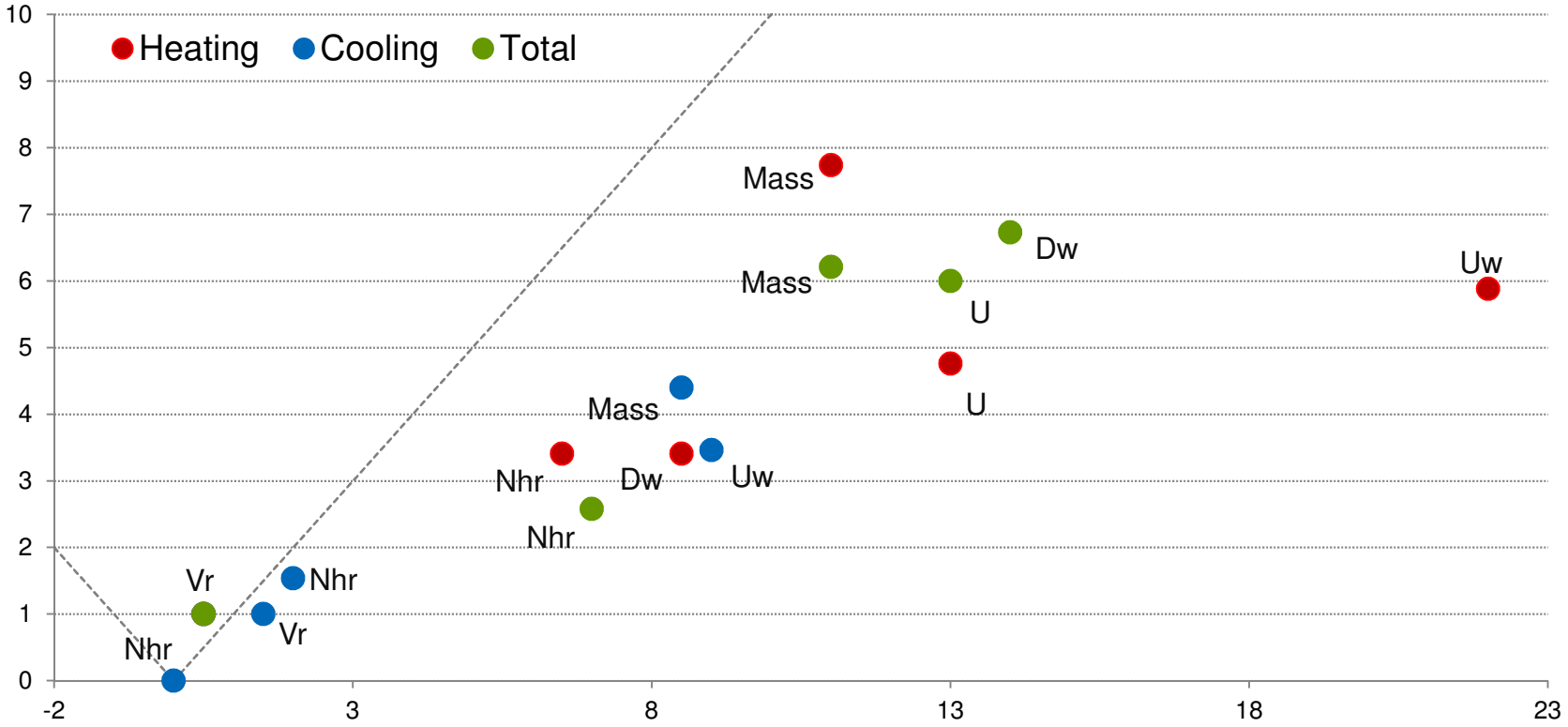

-U : insulation walls
-Uw : insulation windows
-Dw : orientation windows
-Mass : constructions mass
-Vr : ventilation ratio
-Nhr : heat recovery efficiency

ENVELOPE ANALYSIS

Influence of the constructions method on energy consumption

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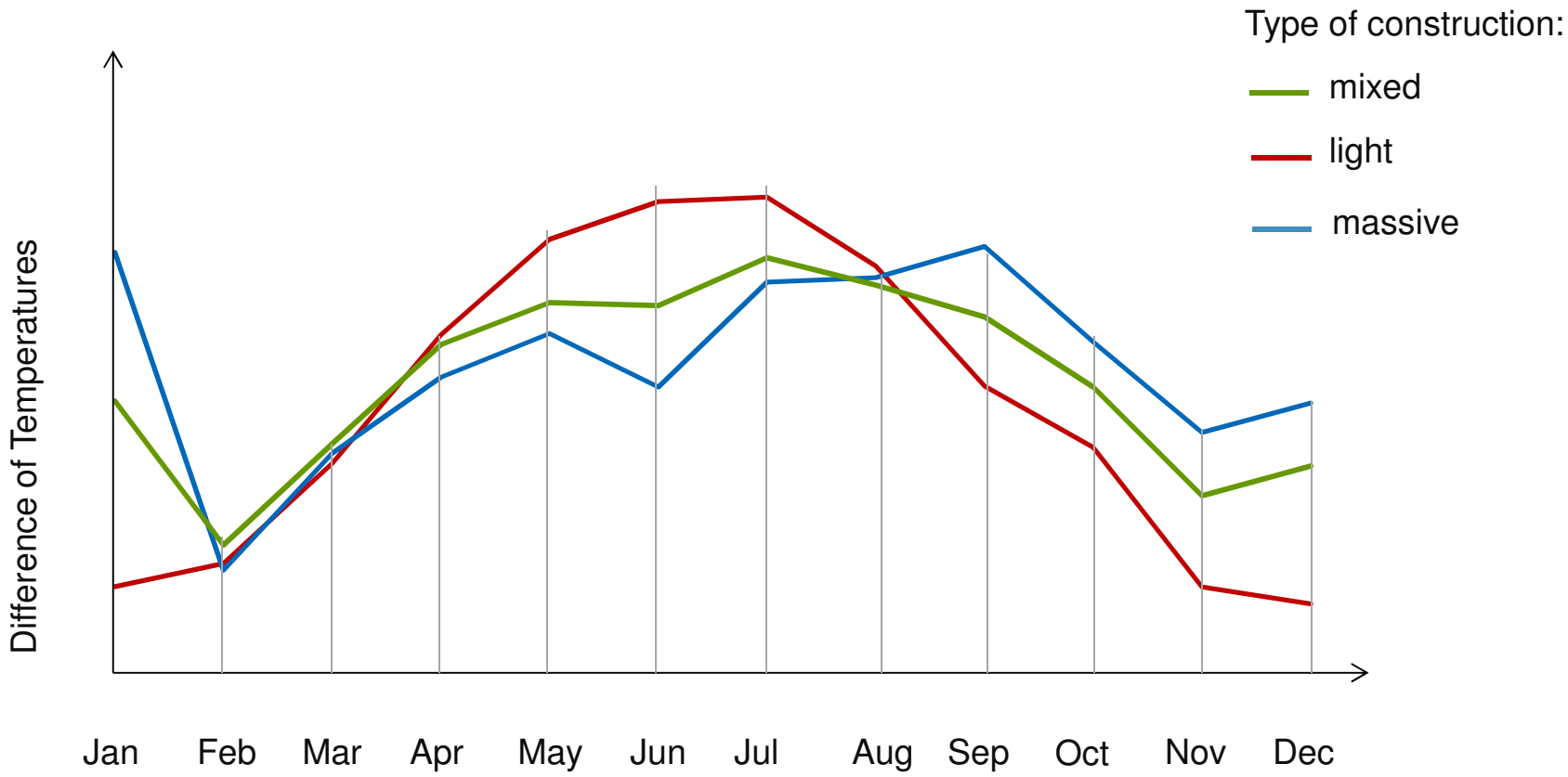

WINDOWS ORIENTATION ANALYSIS

Influence of the orientation of the windows on indoor comfort

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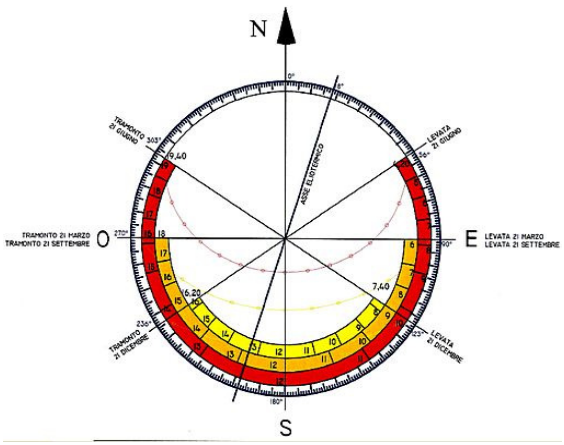

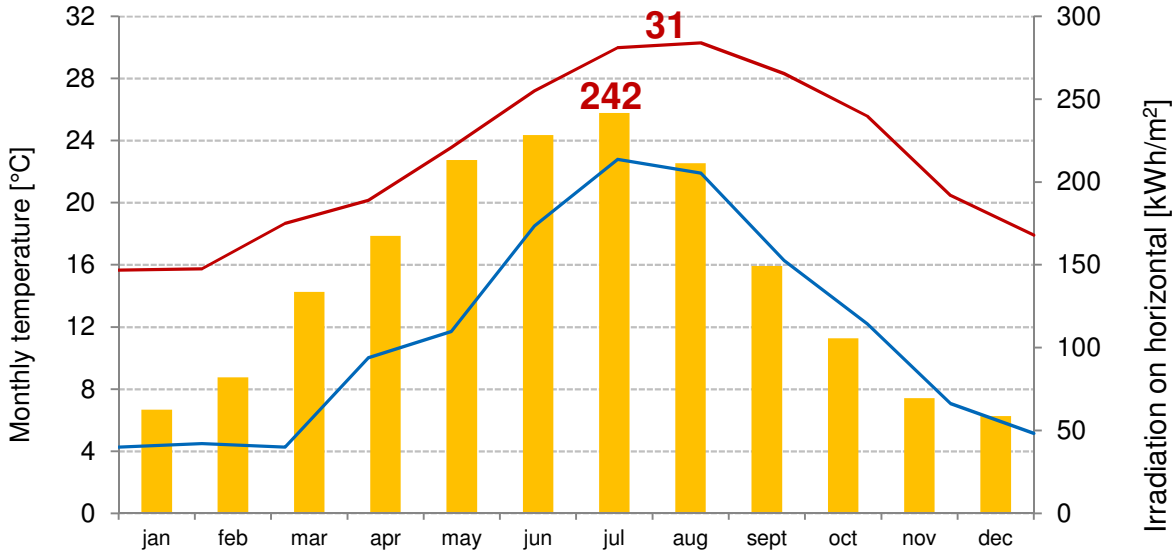

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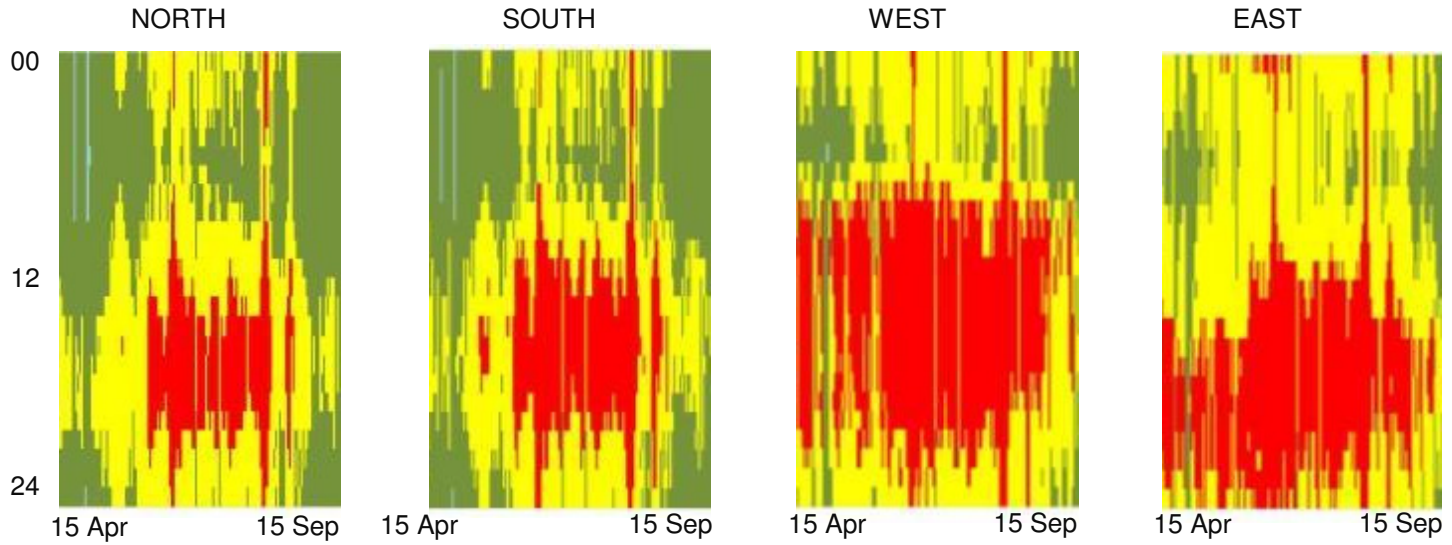
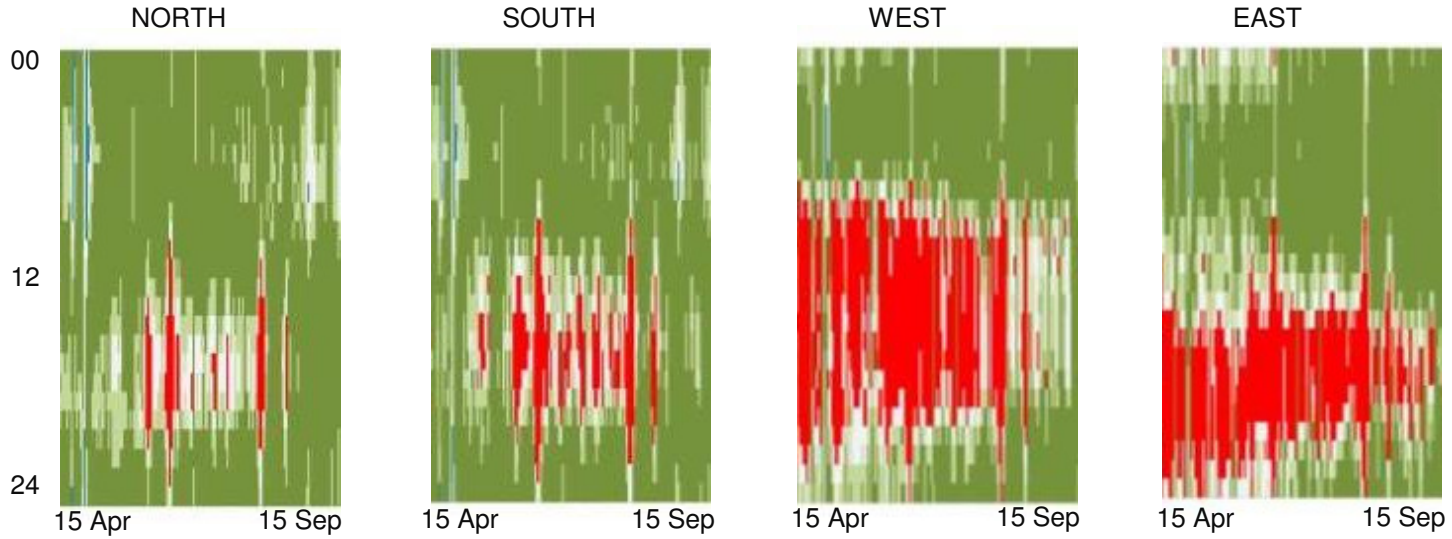
STATIC COMFORT METHOD: evaluation of temperatures



ADAPTIVE COMFORT METHOD: evaluation of AH classes



BUILDING AUTOMATION SYSTEM ANALYSIS

Influence of domotics on indoor comfort

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	BASE	MIDDLE	DOMOS	DOMOS+
VENTILATION	none	none	MOVABLE If Tin>Text and Text>22°C 1 vol/h	MOVABLE If Tin>Text and Text>22°C 5 vol/h
INFILTRATION	0,3 vol/h	0,6 vol/h	0,3 vol/h	0,3 vol/h
SHADDING	none	FIXED 60% south 30% west	MOVABLE If Tin>Text : Text>24°C and Ir>140 W/mq 70%	MOVABLE If Tin>Text : Text>24°C and Ir>140 W/mq 80%

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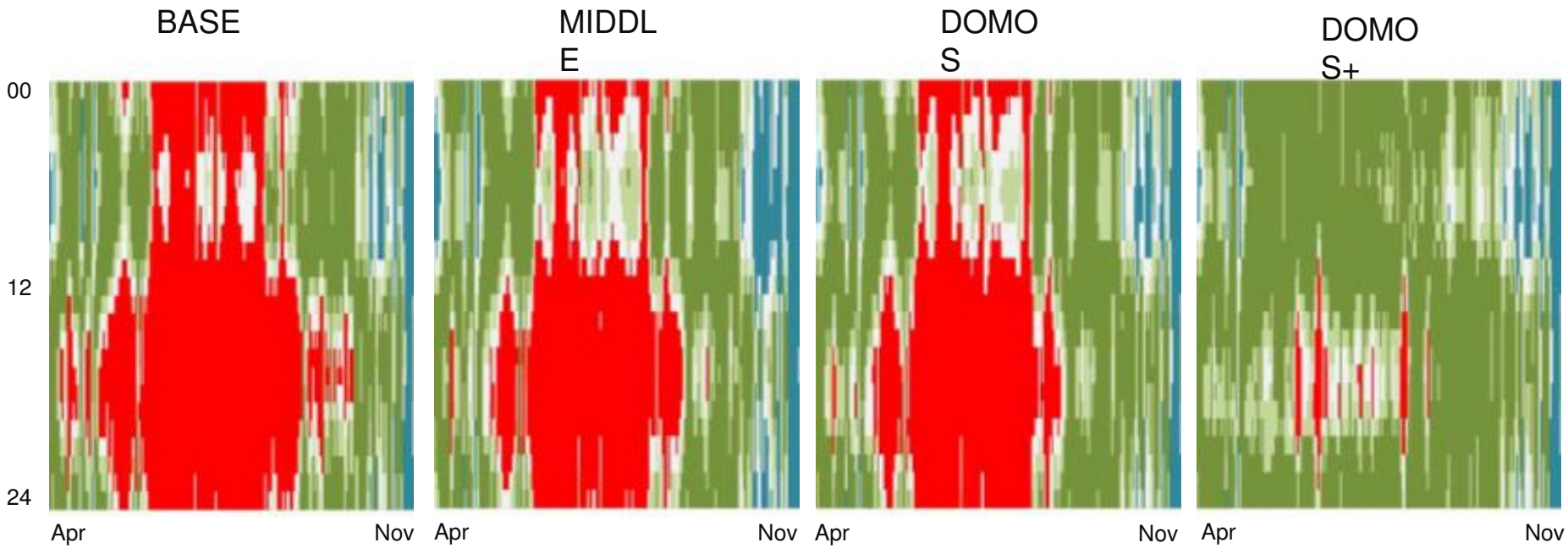
ADAPTIVE COMFORT METHOD: evaluation of Active House hourly Class



MEDITERRANEAN ACTIVE HOUSE MODEL

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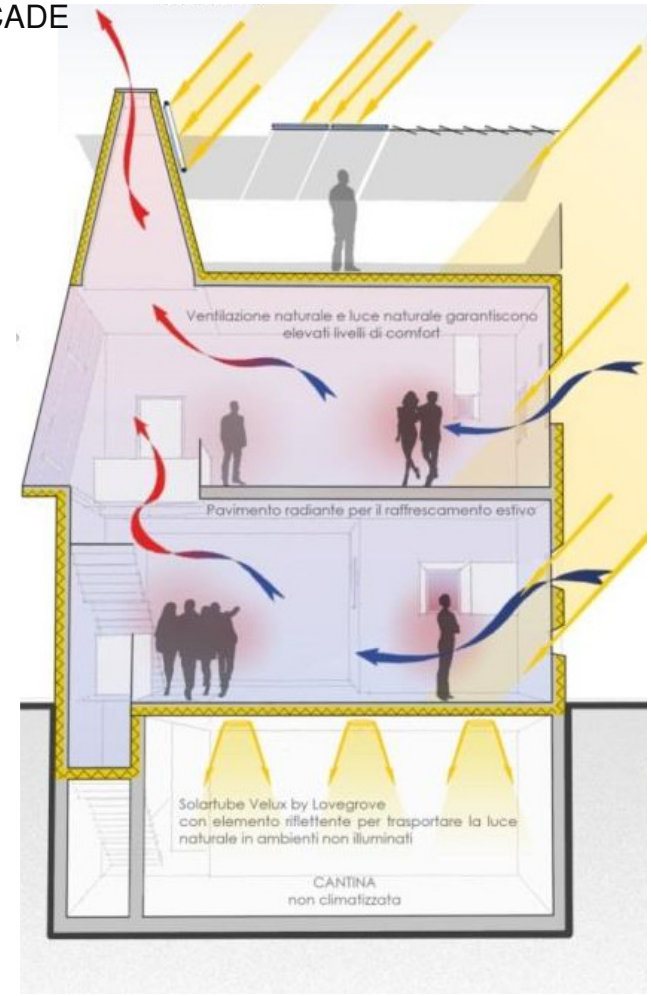
NORTH FACADE



SOUTH FACADE

INVERTED: North and East facades open
South and West facade closed

Use of cold light

Ventilation stack and cross natural ventilation

Low surface/volume ratio: low thermal waste thorugh facades

Roof: not piched but shaded

Wall: light construction with medium U values

Floor / Roof: massive construction

Windows domotic system

USERS MISUSE ANALYSIS

Analysing different type of interaction

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	FAMILY			
	1	2	3	4
00.00 / 08.00	IN	IN	IN	IN
08.00 / 12.00		IN		
12.00 / 13.00	IN	IN		
13.00 / 15.00		IN		
15.00 / 18.00			IN	
18.00 / 24.00	IN	IN	IN	IN

		SYSTEM	
ACTIONS		shadding	ventilation
thief-proof	A	V	V
	B	V	X
	C	X	X
preventing noise	D	V	X
	E	X	X
air feeling	F	V	V
	G	X	V

USERS MISUSE ANALYSIS

Influence of users different use of space and domotic systems

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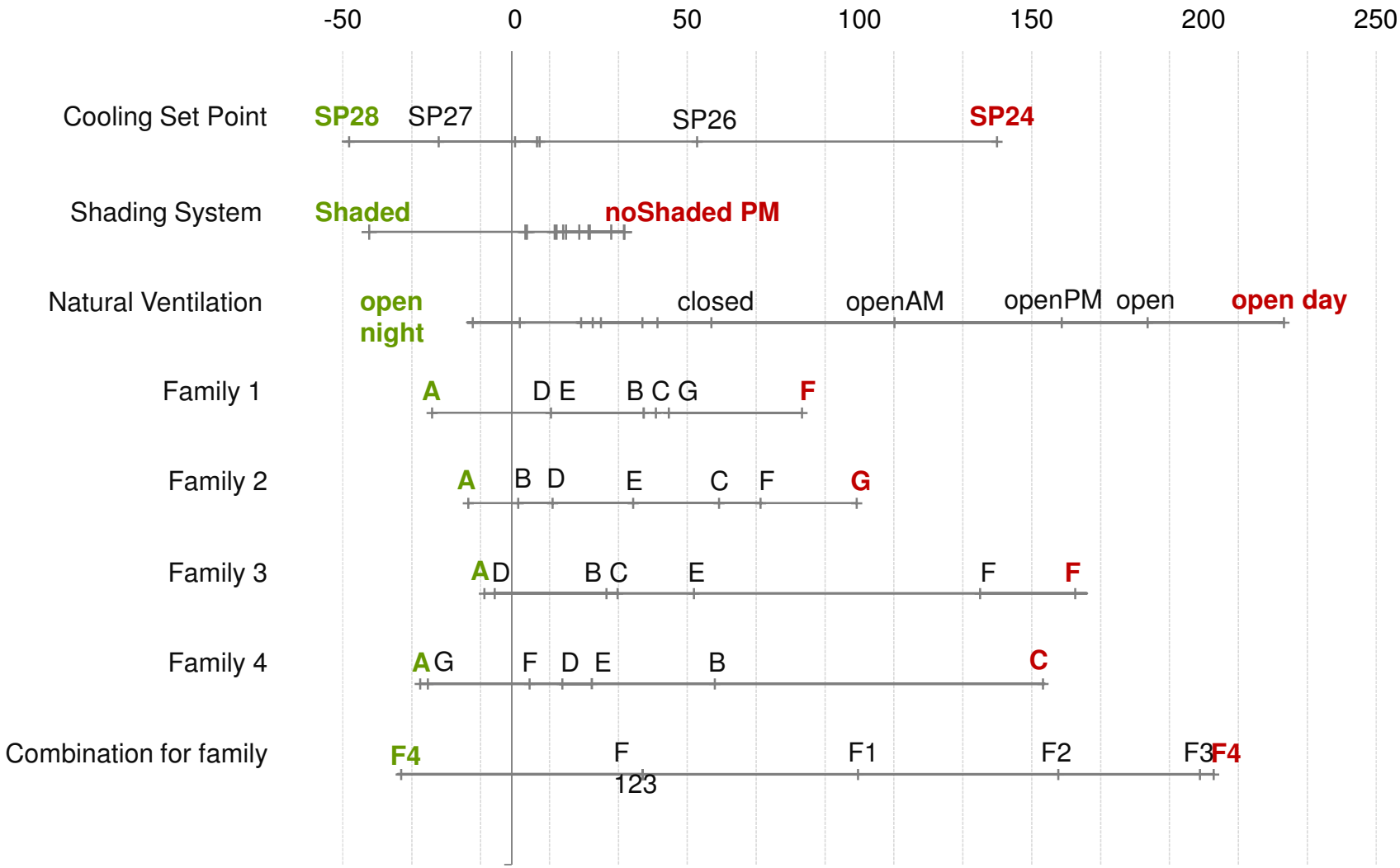

CASE STUDY

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VELUXlab

CENED: A+

First NZEB in a University Campus

First ActiveHouse certified as built

VELUXlab: COMFORT

Enhancing passive strategies

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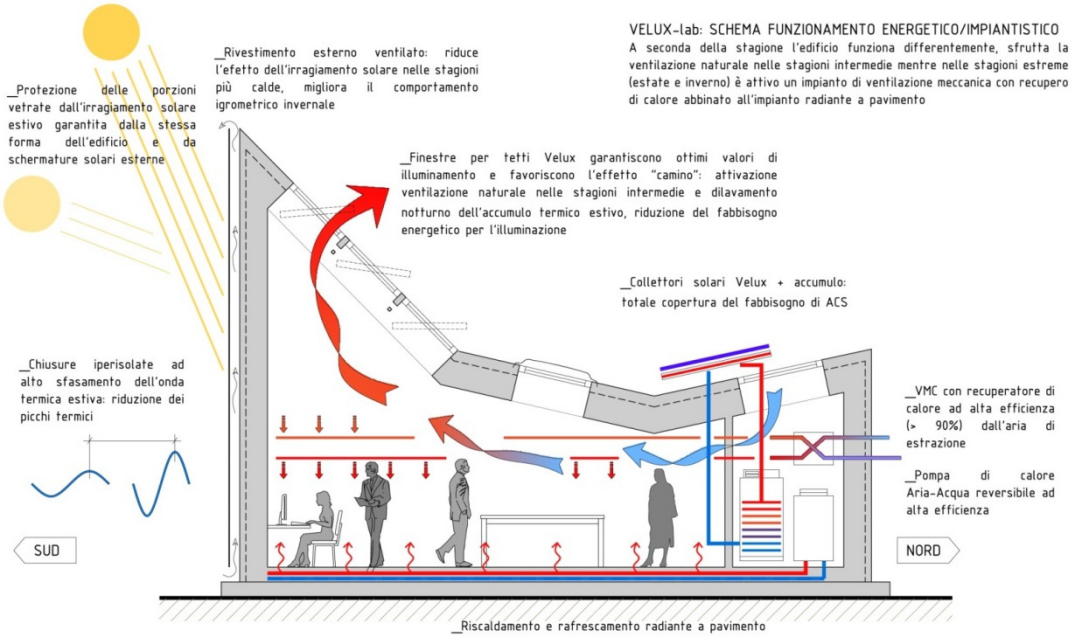


Dynamic simulation as decision tools

Thermal shield

Use of natural ventilation to cool

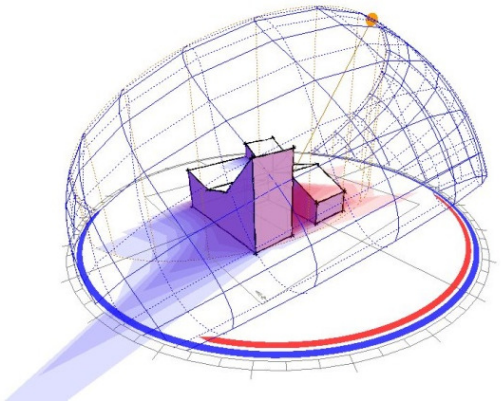
Integration of high performance system

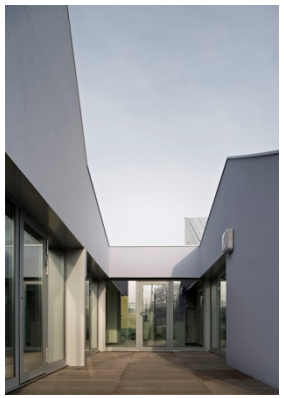
Exposition and sun analysis to prevent overheating

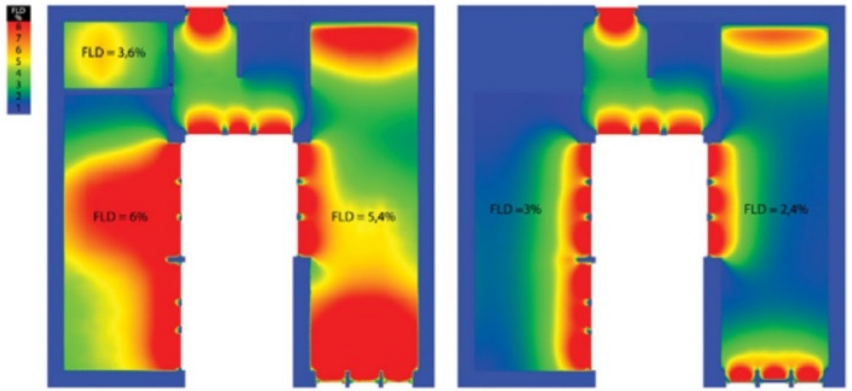
Light analysis for roof-windows placement

Use of acoustic high performant roof (insulation and finishing)

Use of air-cleaning materials (zeolite panels for polluta







VELUXlab: ENVIRONMENT

Reducing the impact on the enviroment

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Re-use of the old structure

Use of natural or recyclable new materials

Attention the production process

Re-use of process waste

VELUXlab: ENERGY

Use of the sun

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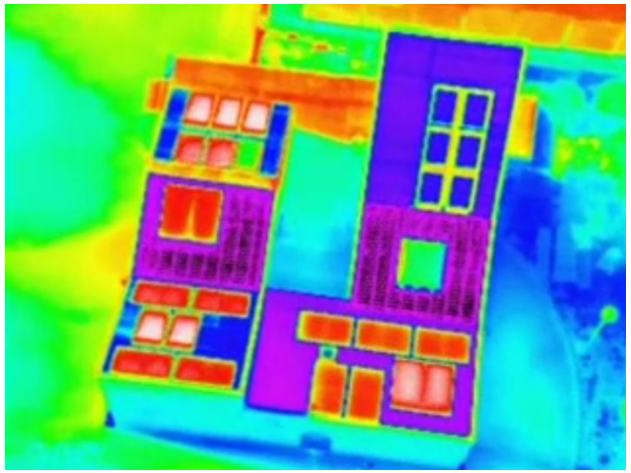

VELUXlab:THE RADAR

Comparison between the old Atika and the new building

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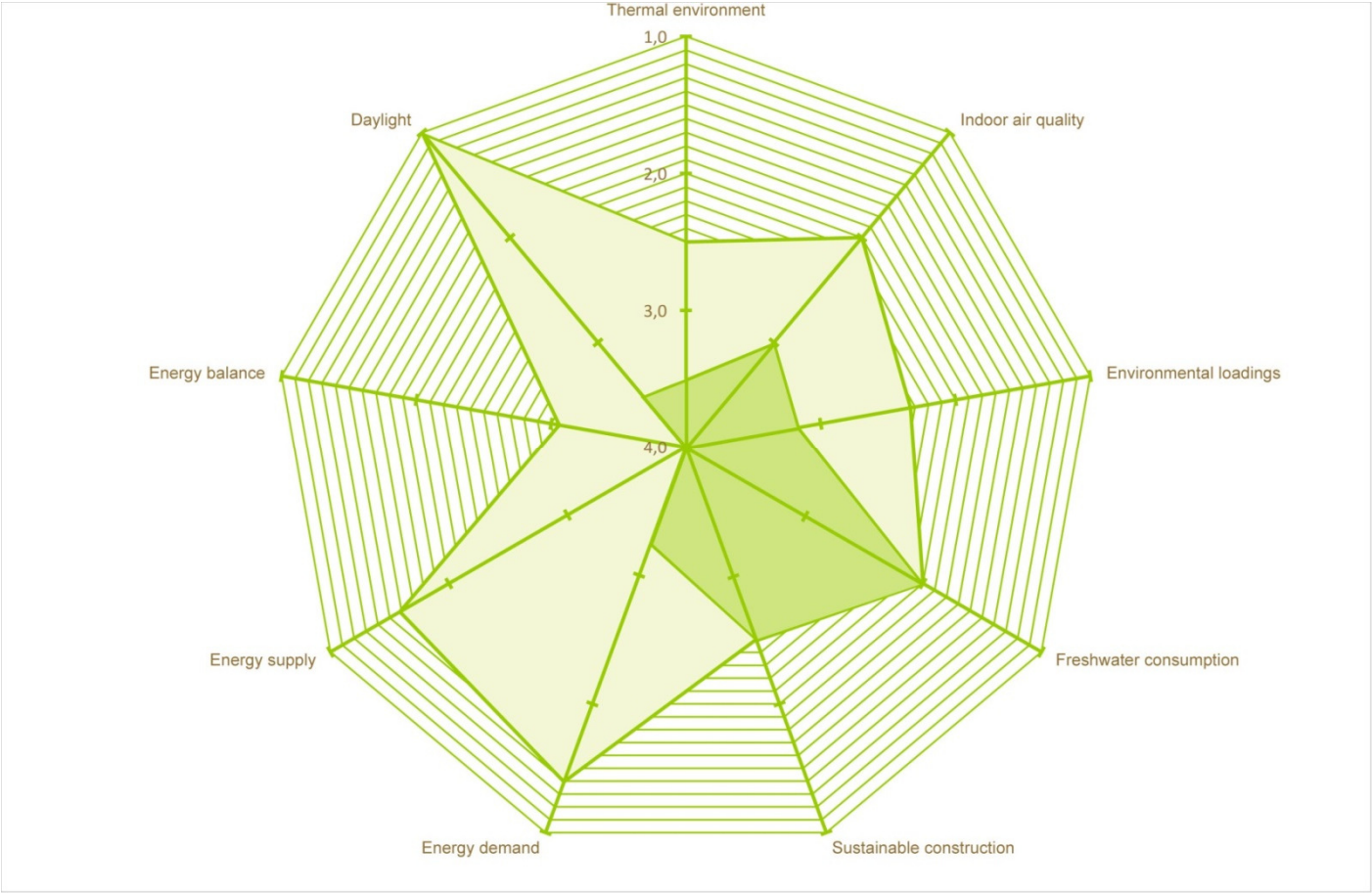

VELUXlab:THE RADAR

The certification with the new tool

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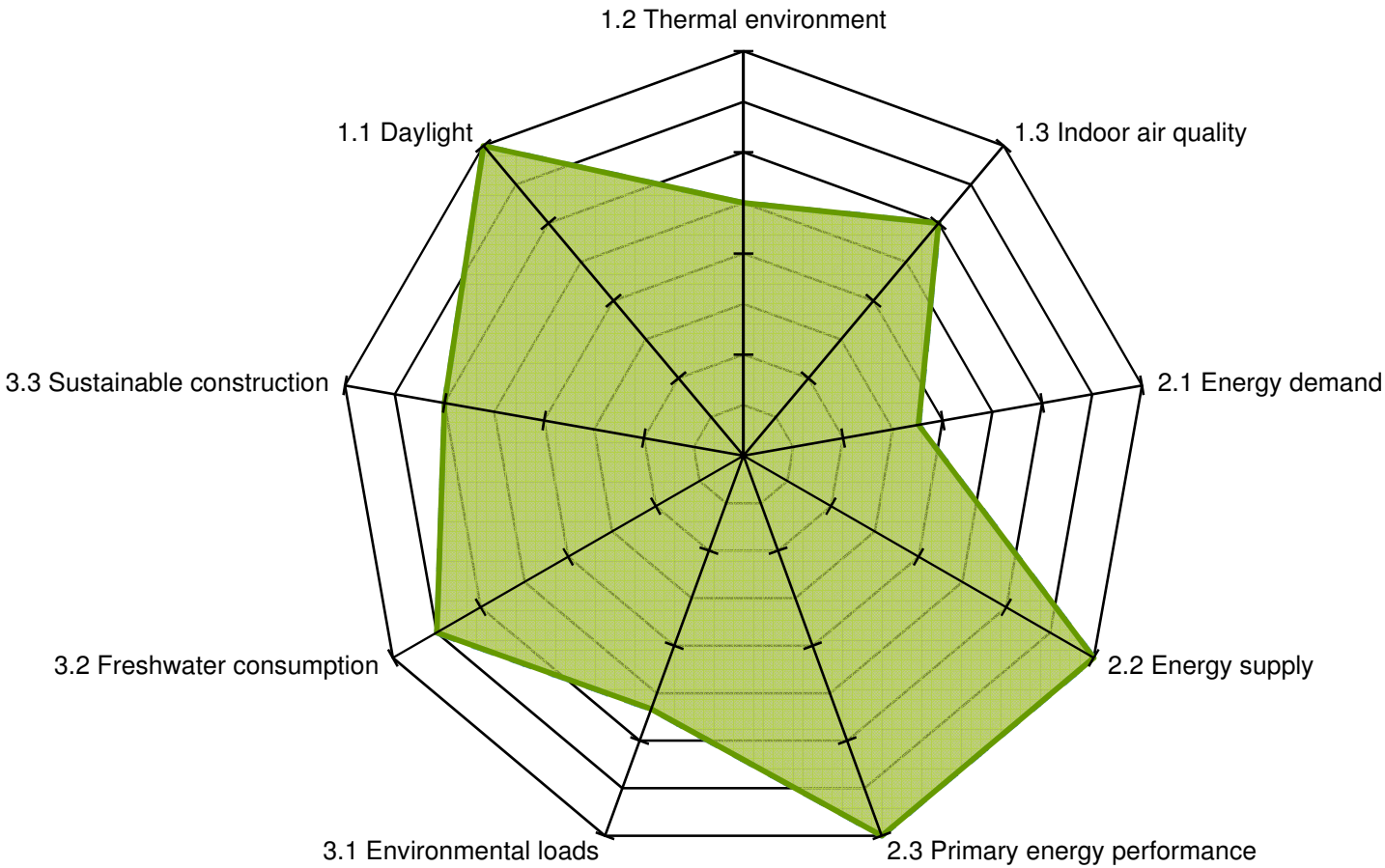

VELUXlab: ONGOING RESEARCH

Energy consumption due to users interaction

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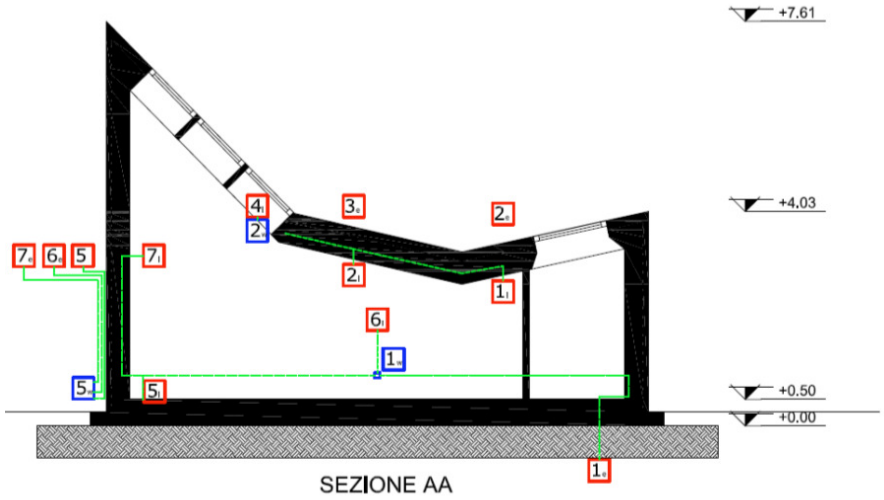
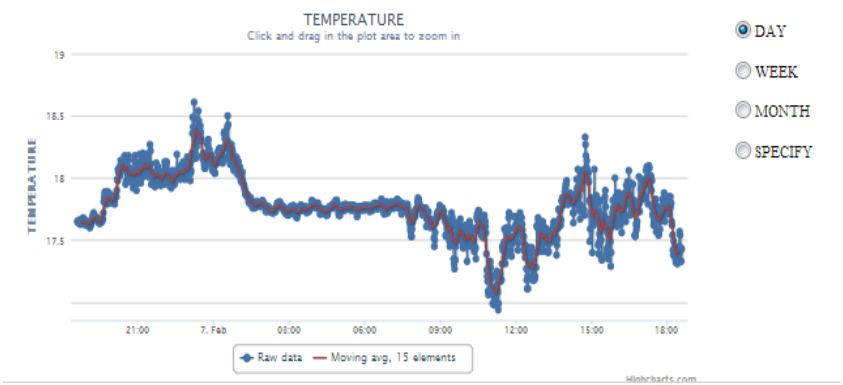




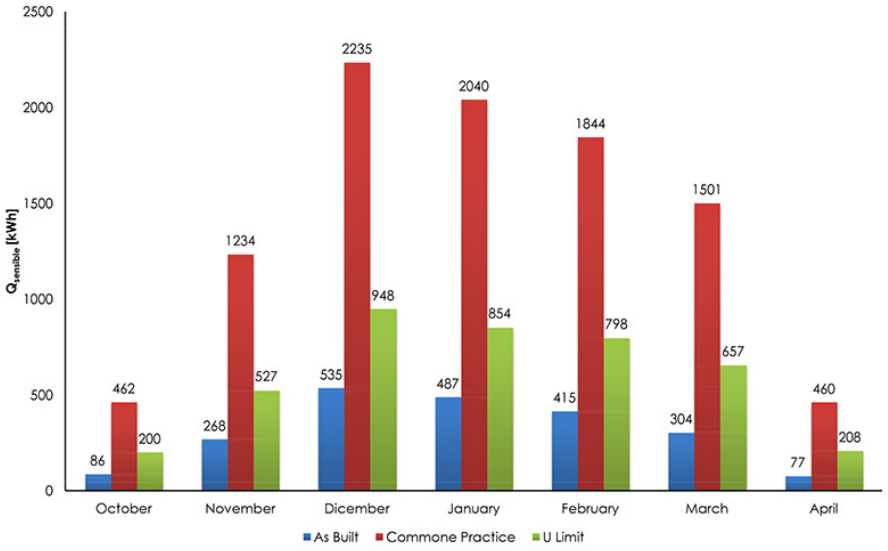
Innovative wireless monitoring system

Innovative sensors

Real time streaming on online platform

Agumented reality for virtual visualization

Real performance detected



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Questions and Answers

Thank you!


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