LIFE Program HeroTile project

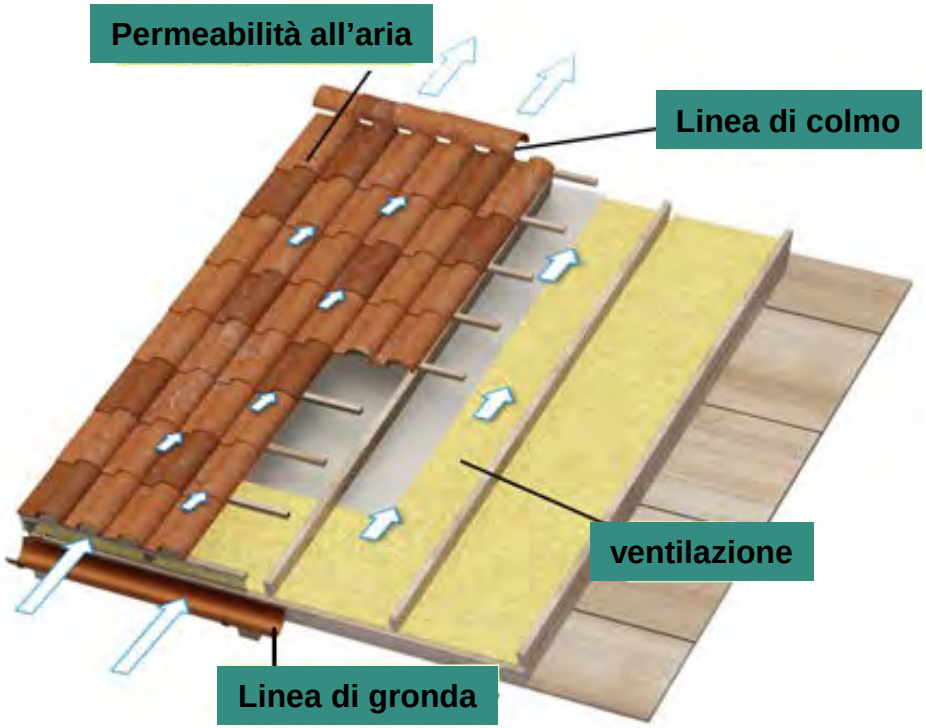
Giovanni Zannoni

Università degli Studi di Ferrara | DA Dipartimento Architettura Ferrara

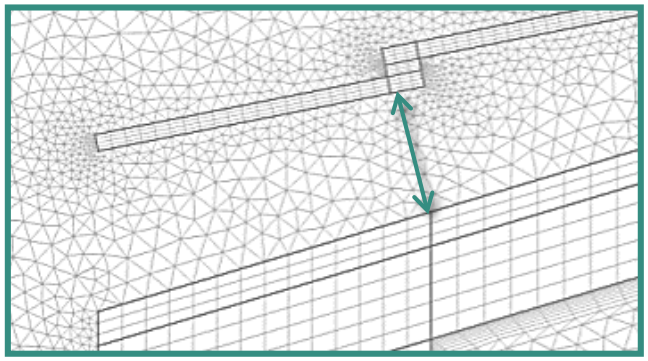
L'efficacia della ventilazione dei tetti a falda con la nuova tegola lifeHEROTILE

Nei tetti ventilati l'aria entra dalla linea di gronda ed esce dalla linea di colmo.
Questa circolazione d'aria smaltisce una parte del calore solare che riscalda il sottotetto e riduce i consumi per il raffrescamento.

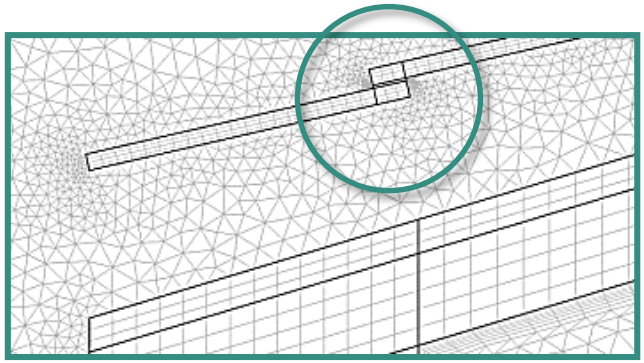
Aumentare la permeabilità all'aria fra le tegole migliora questa prestazione



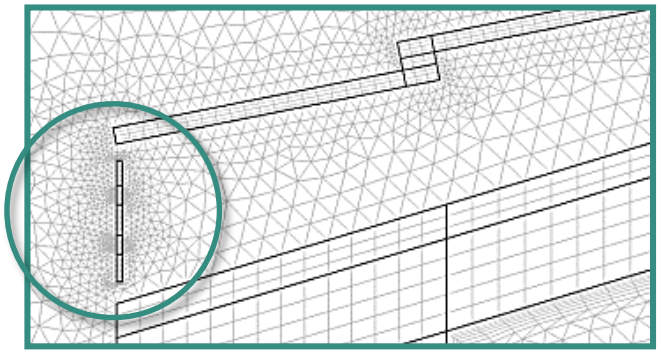
Simulazioni al computer



Strato di ventilazione 4/8 cm



Permeabilità all'aria 0.0/2.5/9.0 mm

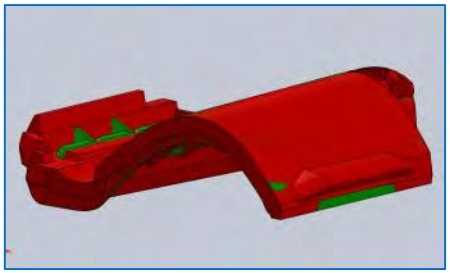
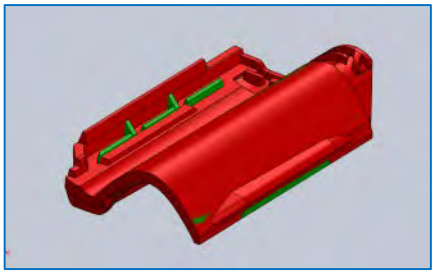


Apertura in gronda 0-50-100%

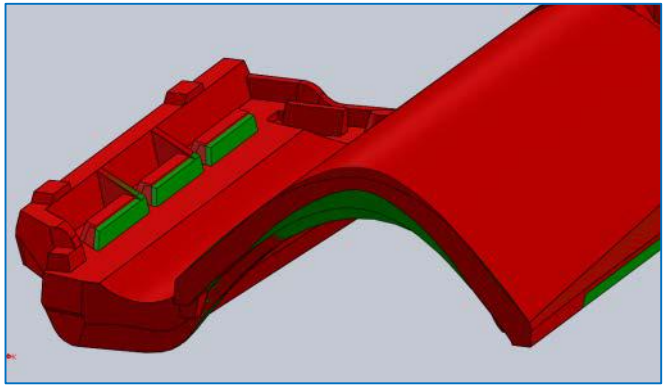
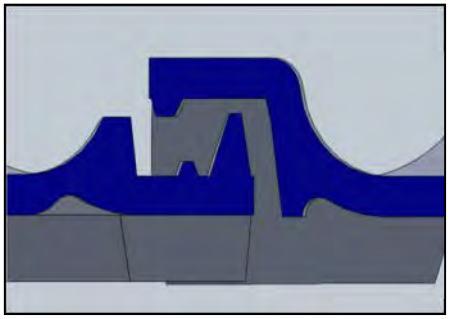
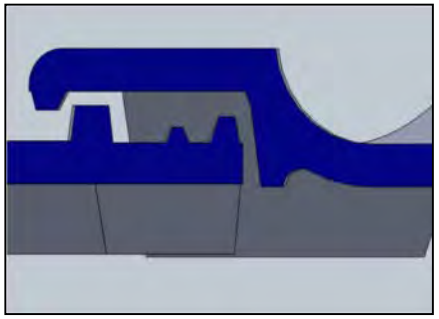
Obbiettivo del progetto HEROTile è stato:

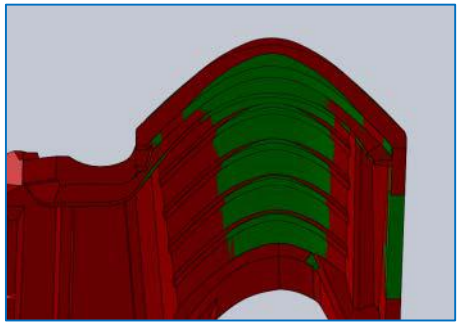
- **Riprogettare il design delle tegole**
- **Confrontarne le prestazioni con le tegole standard**
- **Selezionare la migliore soluzione e produrla**
- **Verificare le prestazioni con test al vero**

24 soluzioni individuate e testate di tegola portoghese e marsigliese





Matrice di valutazione

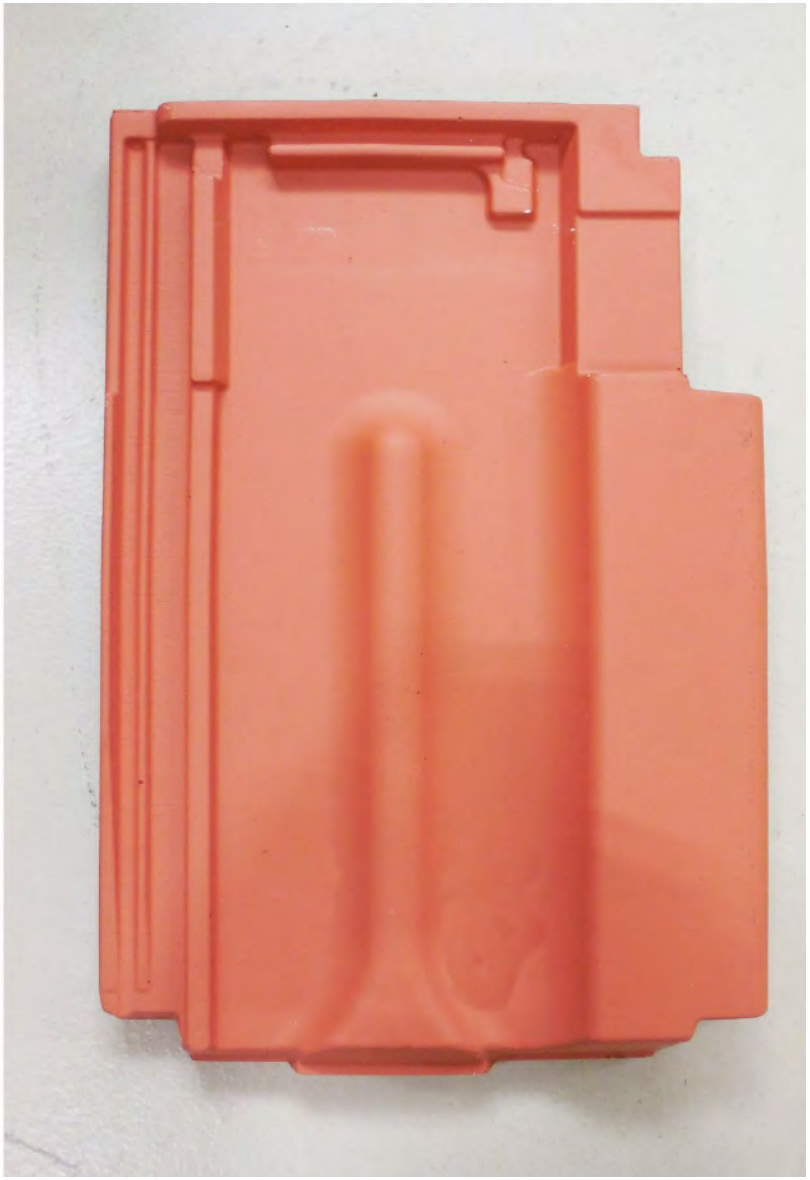
Parameter	Case_01n	Case_02n	Case_03n	Case_04n	Case_05n	Case_06m	Case_07m	Case_08mb	Case_09m	Case_10m
Air permeability	**1.77**	**2.17**	**1.51**	**1.92**	**1.73**	**1.36**	**1.33**	**1.58**	**1.81**	**1.31**
Waterproof	-1.00	-0.36	-0.07	0.14	-0.54	-0.54	-0.79	-1.00	-1.00	-0.79
Conformity of standard regulation	0.00	0.00	-0.21	-0.48	-0.48	0.00	-0.48	0.00	0.00	0.00
Aesthetic index	0.00	-0.48	-0.33	-0.15	-1.00	-0.33	-0.33	0.00	-0.37	0.33
Line production cost	-0.46	-0.64	-0.64	-1.00	-1.00	0.00	-0.46	0.00	0.00	0.00
Unitary cost	-0.13	-0.13	-0.35	-0.35	-1.00	0.00	-0.13	0.00	0.00	0.00
Mechanical performance	-0.44	-0.44	-0.44	-0.44	-1.00	0.00	-0.20	0.00	0.00	0.00
Installation cost	-0.23	-0.23	-0.46	-0.46	-0.77	0.00	-0.54	0.00	-0.23	0.00
Commercial index	0.00	0.29	0.21	0.46	-0.82	-0.07	0.11	0.21	-0.25	0.46
	0.28	0.57	0.17	0.30	-2.24	0.56	-0.32	0.49	0.37	0.48

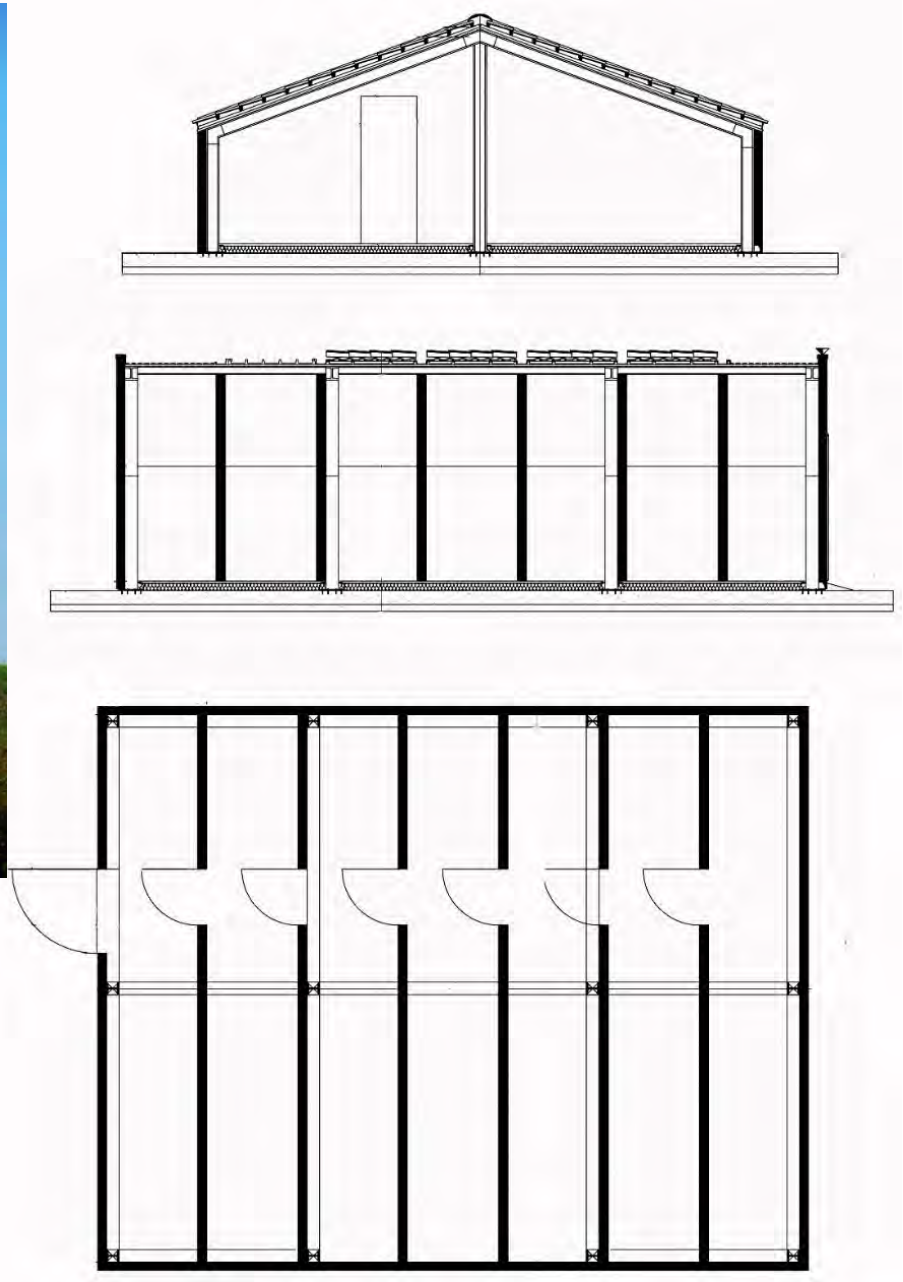
Galleria del vento

prototipazione

portoghese Herotile

marsigliese Herotile





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Mock up con tetto a sette falde

- Marsigliese standard
- Marsigliese Herotile
- Portoghese standard
- Portoghese herotile
- Metallo
- 2 camere di guardia

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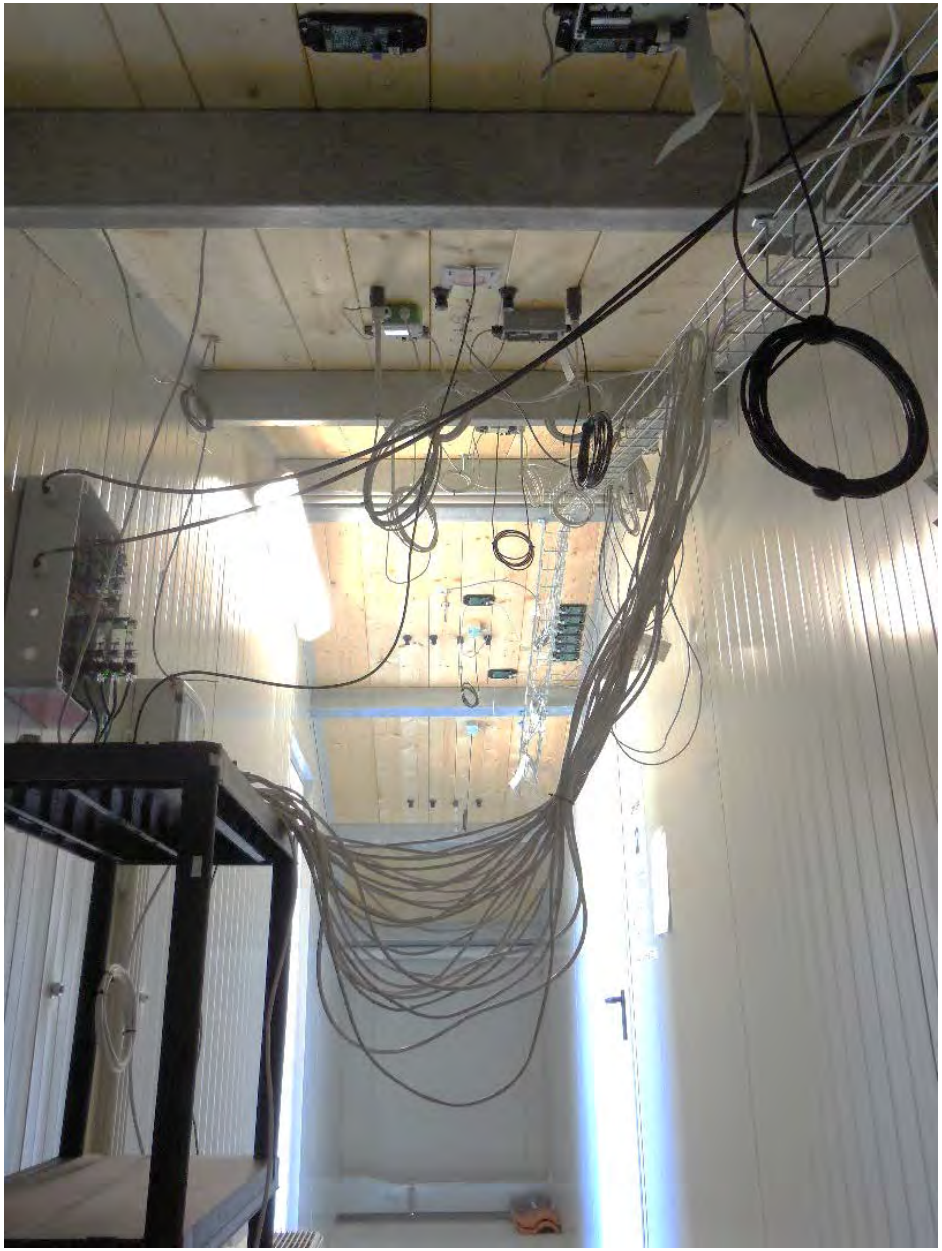
CAI factory Israele

Mock up con tetto piano

Mock up con tetto a sette falde

- **Marsigliese standard**
- **Marsigliese Herotile**
- **Portoghese standard**
- **Portoghese herotile**
- **Metallo**
- **2 camere di guardia**

Strumentazione di monitoraggio



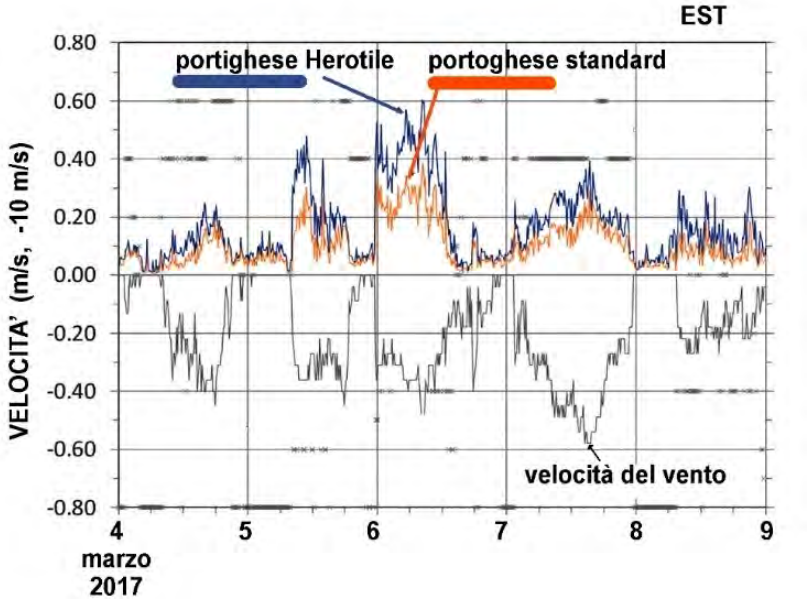
Sperimentazione al vero

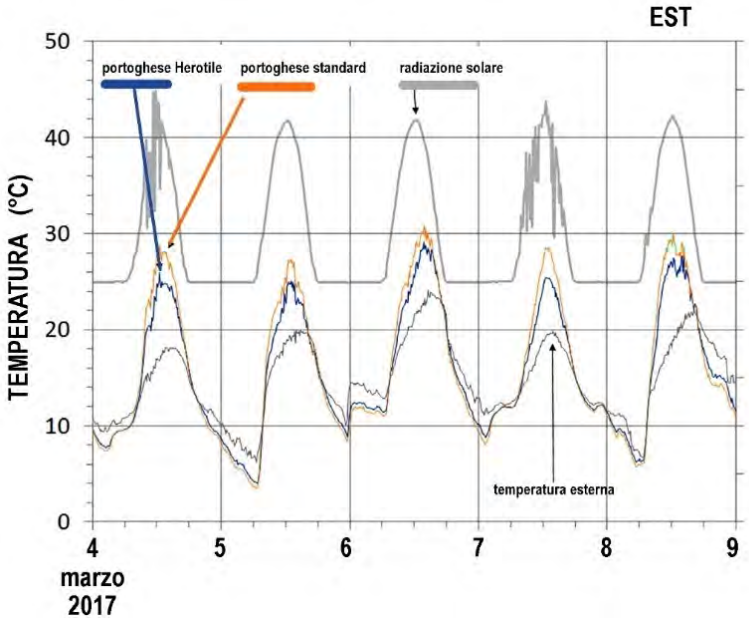
- 2 edifici
- 4 appartamenti

Saragozza, Spagna

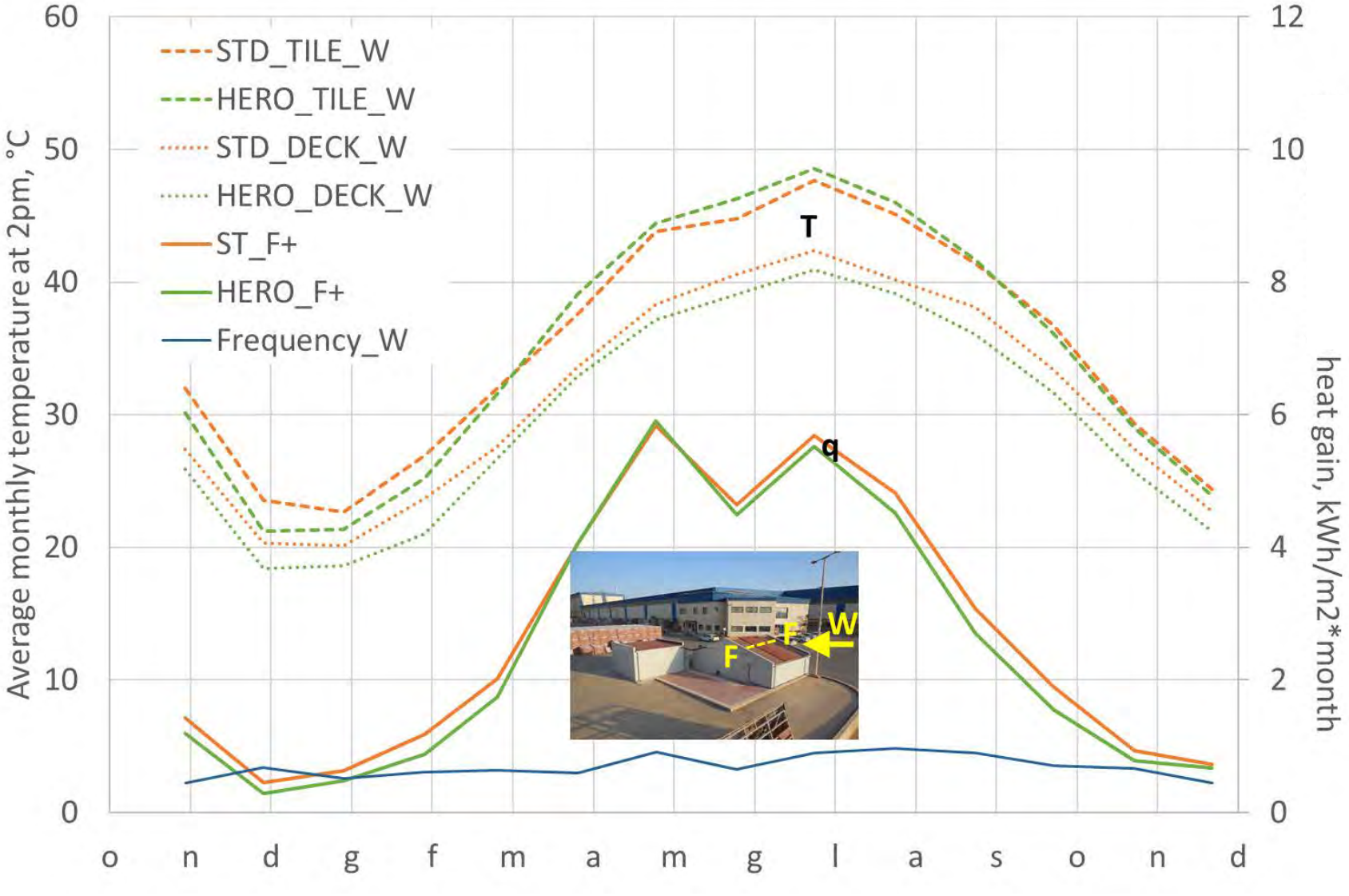
Reggio Emilia, Italia

Primi risultati

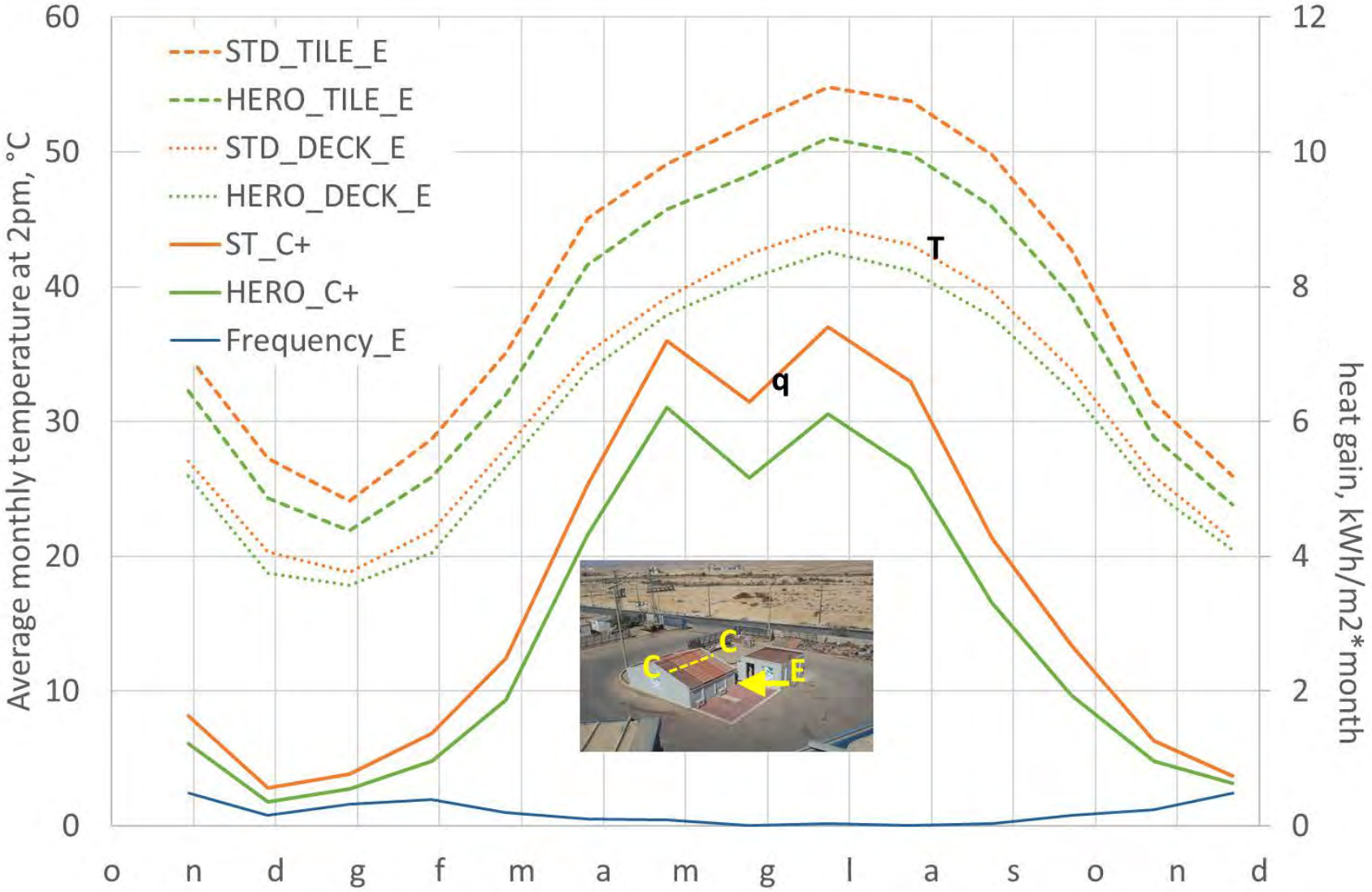




medie mensili falda sopravento

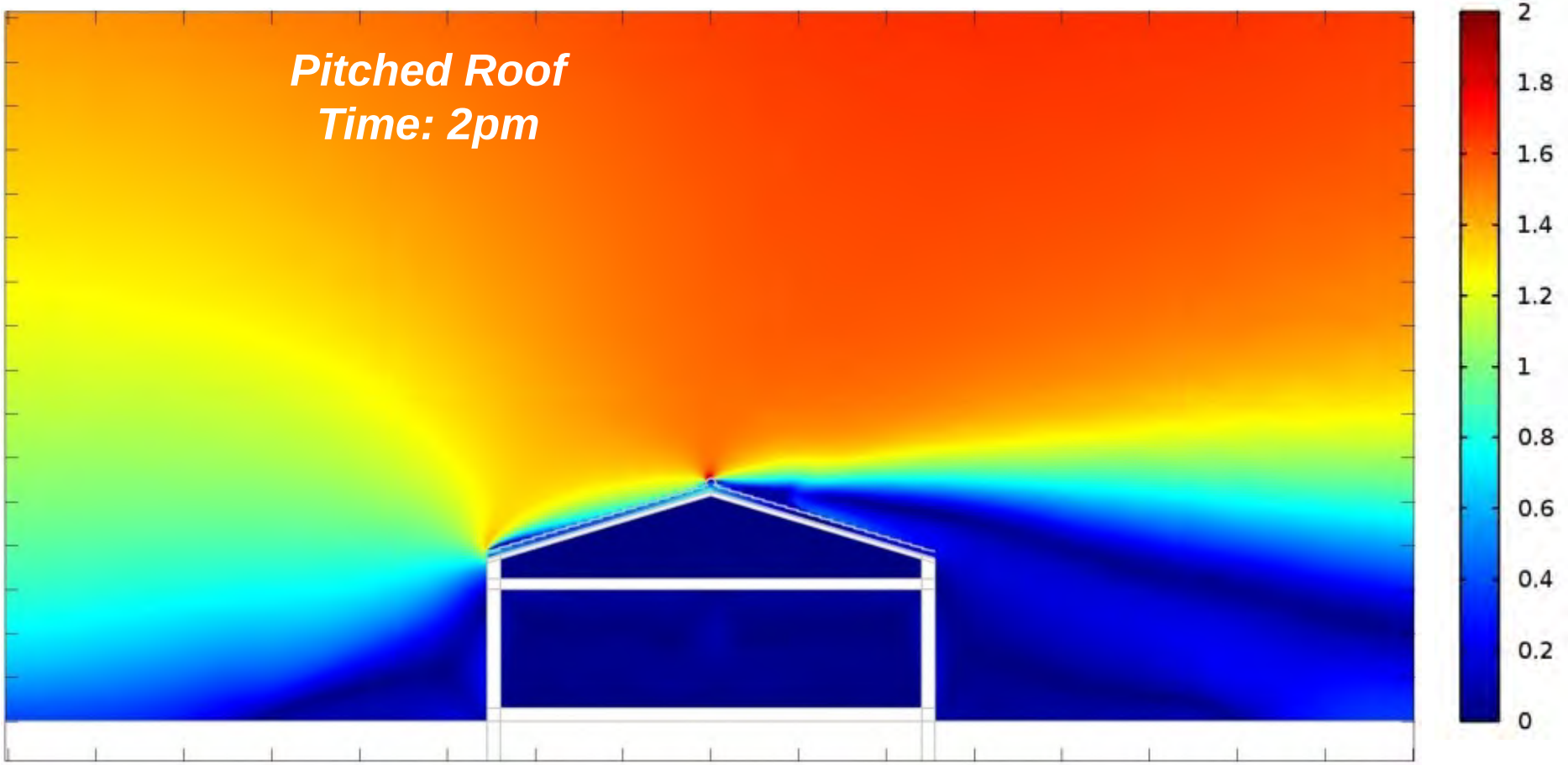


medie mensili falda sottovento

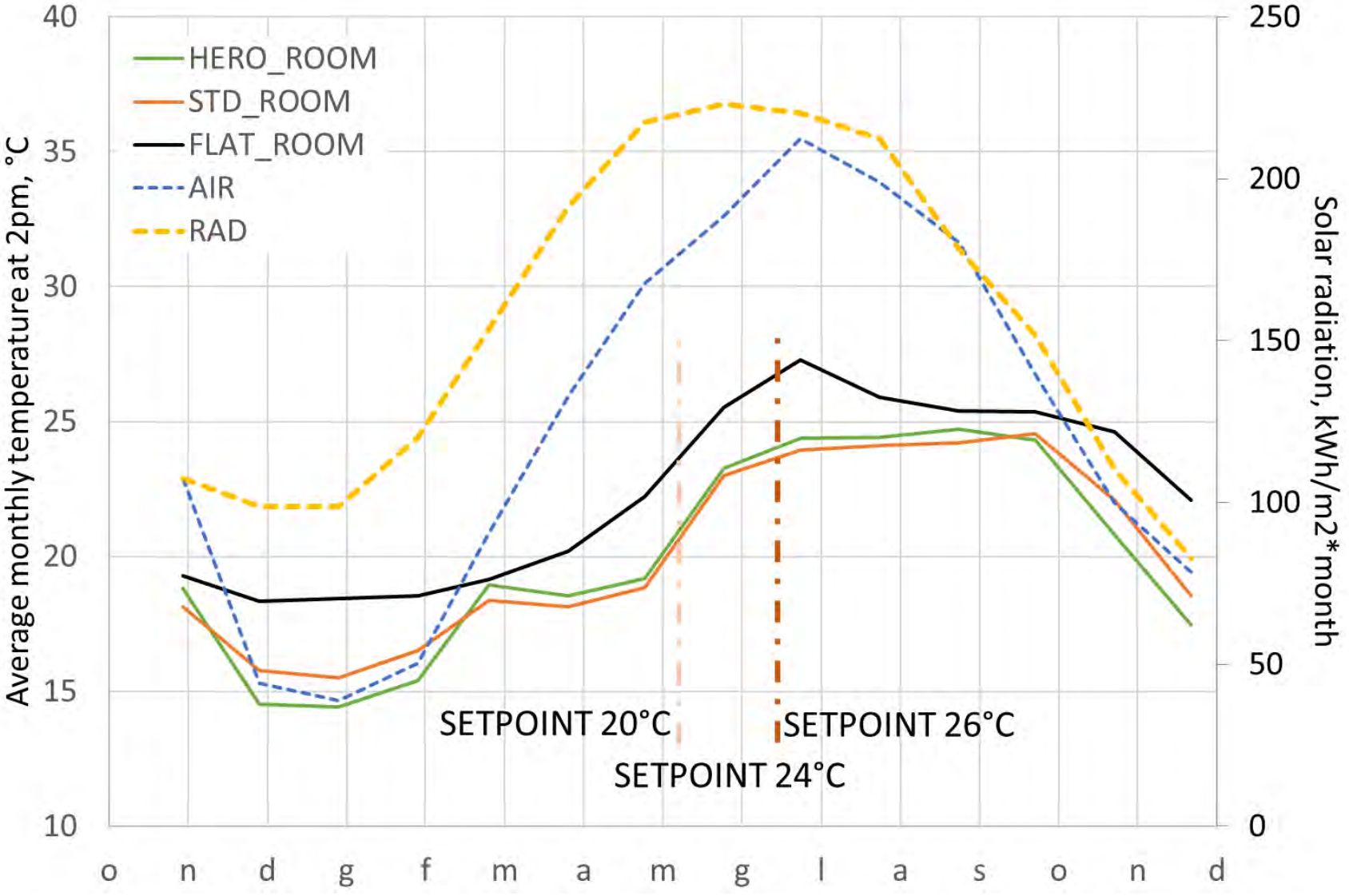


Simulazioni al computer

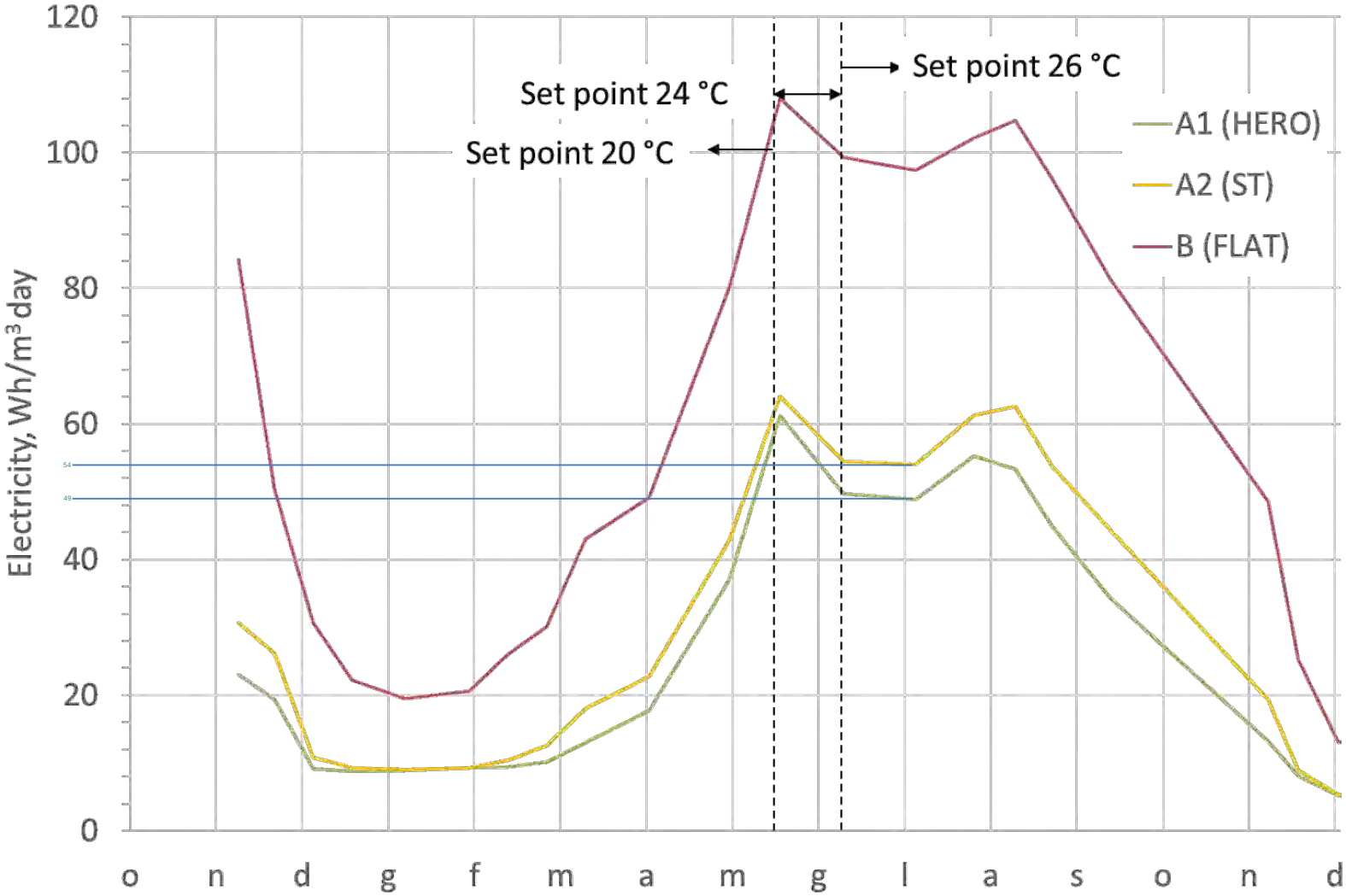
Simulazioni fluidodinamiche al contorno del tetto.
Condizioni sulla falda sopravento e sottovento



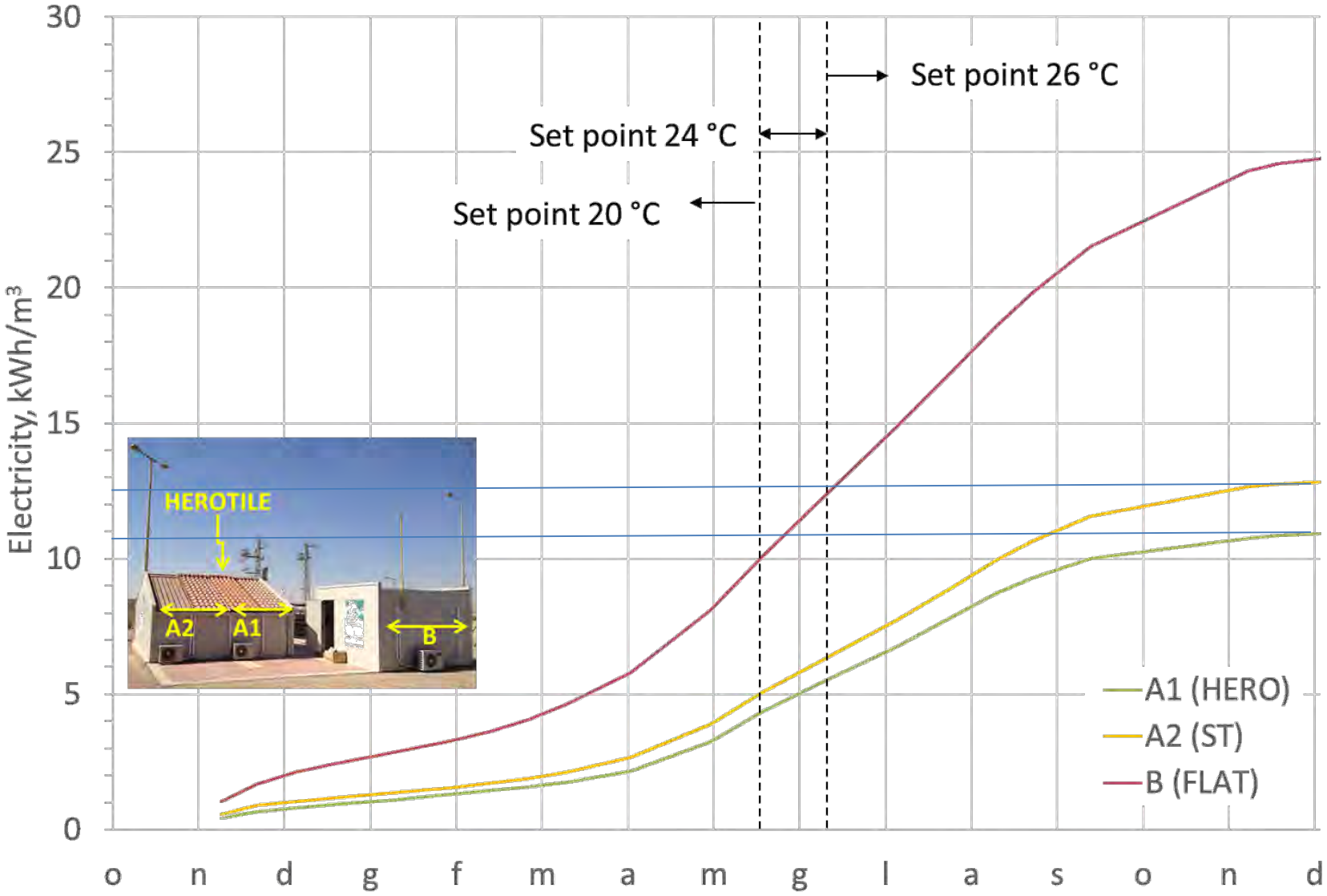
temperatura media mensile (2 pm)



elettricità giornaliera per raffrescamento

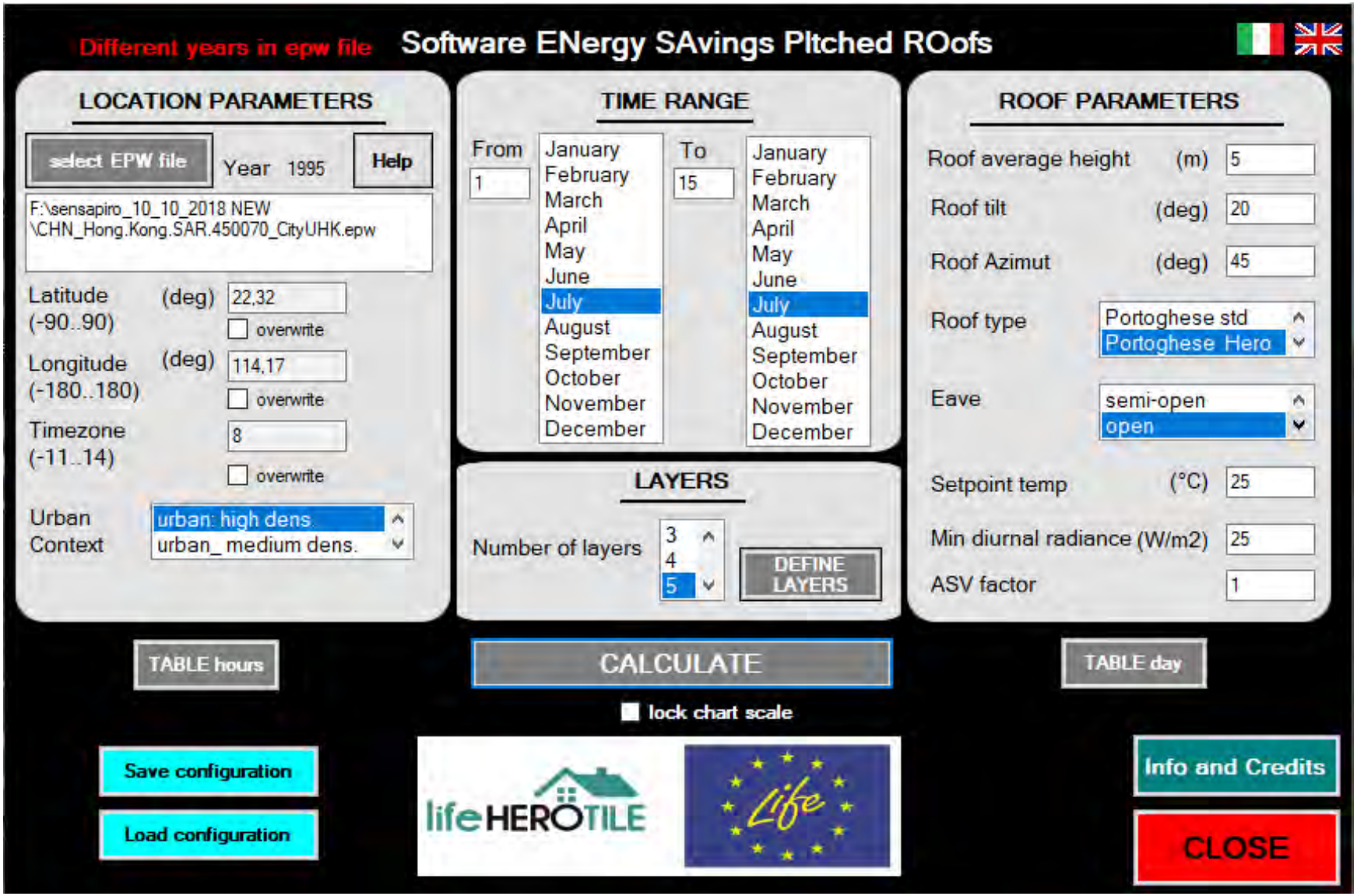


energy supply



SENSAPIRO

Software energy saving pitched roof

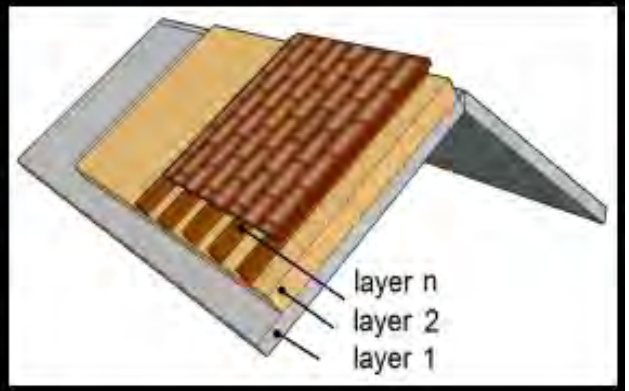


SENSAPIRO

Software energy saving pitched roof

LAYERS

Layer 1 to Layer n		Thickness (mm)	Thermal conducibility (W/mK)	Density (kg/m3)	Specific heat (J/kgK)
L1	Intonaco calce e gesso	20	0,54	1500	1000
L2	Blocco forato	180	0,35	750	840
L3	Cls armato	60	1,8	2500	1000
L4	XPS	60	0,036	30	1200
L5	Plastica	5	0,25	1700	1400



Calculate Decrement Factor

0,10721

BACK

Dec. factor = 0,10721
Thermal transmittance timeshift = 10,254 (h)
Periodic thermal transmittance = 0,044 (W/m2 K)
Internal thermal admittance = 3,392 (W/m2 K)
External thermal admittance = 1,078 (W/m2 K)
Component thermal resistance = 2,271 (m2 K/W)
System thermal resistance = 2,441 (m2 K/W)

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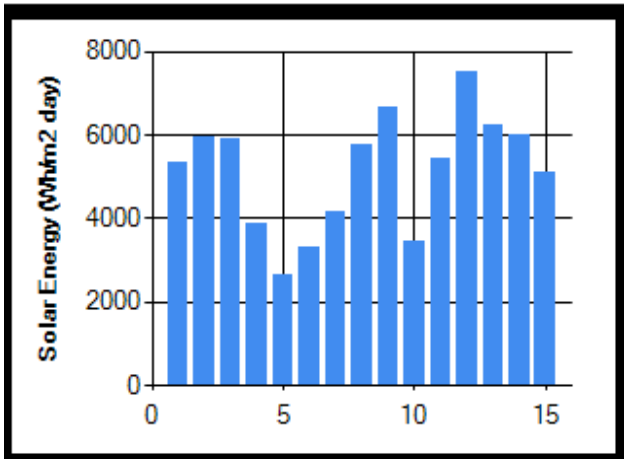
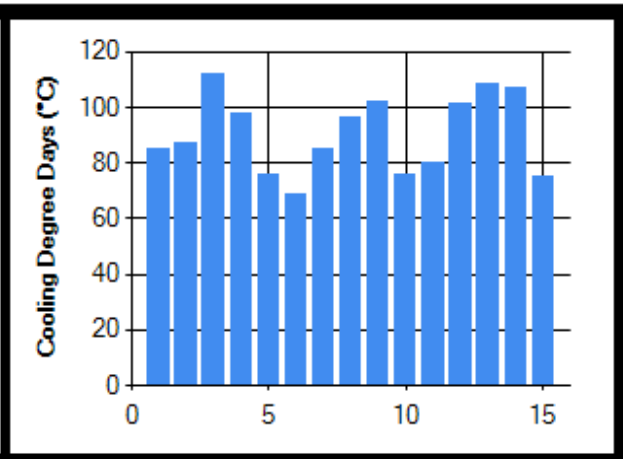
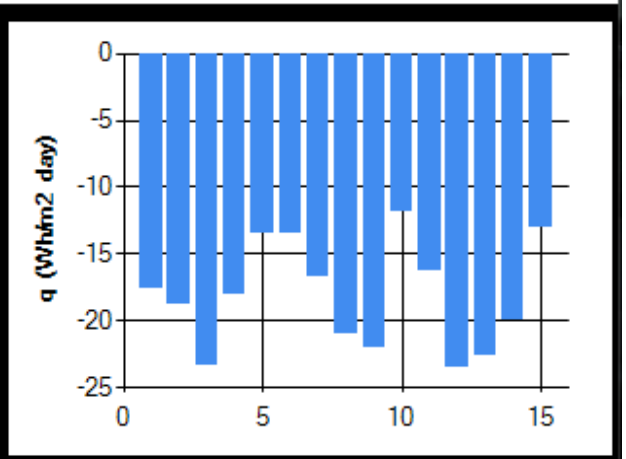
Software energy saving pitched roof



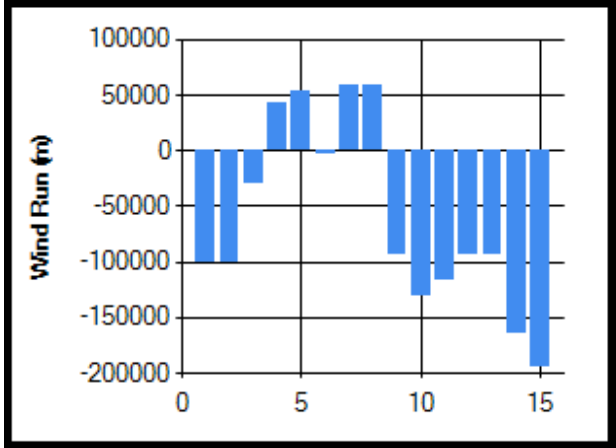
Average = 5154,6



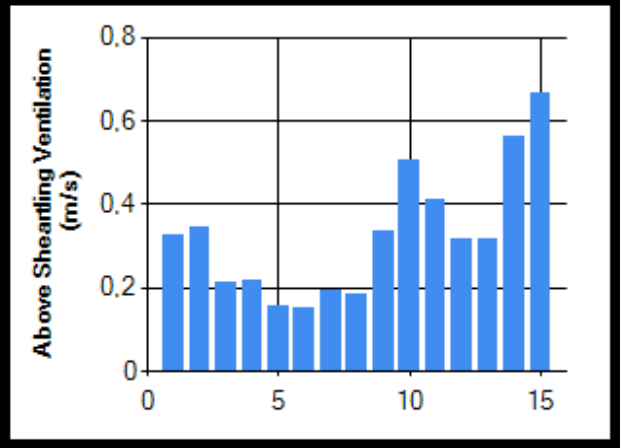
Average = 90,533



Average = -18,116



Average = -60431,8



Average = 0,327

Period: 1/7-15/7 15 days

Sensible Cooling Load =-272 (Wh/m2)

Outdoor average temperature = 28,95 °C

Setpoint T: 25
Dec. factor : 0,10721
Roof tilt: 20
Roof average height: 5
Roof Type: Portoghese Hero
Eave: open
Urban context: urban: high dens.
Location: HONG KONG
Number of layers: 5
fASV : 1
Roof azimut: 45

Generate report

CLOSE

Grazie

Giovanni Zannoni
zannoni@unife.it