

edilportale[®]

TOUR 2016

Efficienza energetica e comfort abitativo
Tecnologie non invasive e sicurezza
Sostenibilità economica e ambientale

in collaborazione con



Roma, 15 giugno 2016

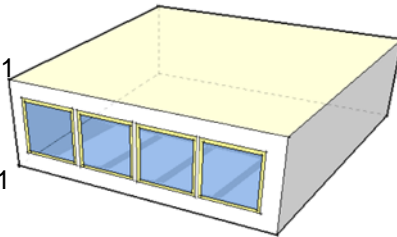
“Efficienza energetica e comfort termoigrometrico degli occupanti”

Andrea Gasparella

Edifici di Riferimento



Involucro:
Vetro singolo
 $U_{gl}=5.7 \text{ W m}^{-2} \text{ K}^{-1}$
Telaio in legno
 $U_{fr}=3.2 \text{ W m}^{-2} \text{ K}^{-1}$



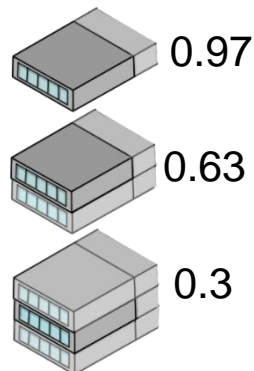
Generatore: Standard
Emissione: Radia
Controllo: On-Off
Distribuzione: Isolamento moderato



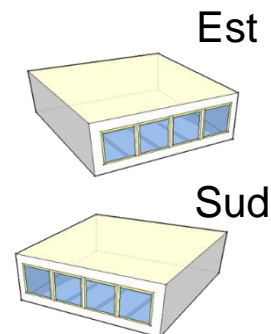
Involucro opaco

$R_1=0.97 \text{ m}^2\text{KW}^{-1}$
 $R_2=2.04 \text{ m}^2\text{KW}^{-1}$

Rapporto S/V



Orientazione



Clima



12 Edifici di riferimento in due località

Strategie per la riqualificazione energetica



ISOLAMENTO ESTERNO

- Da 0 a 20 cm (step 1cm)
- Muri esterni
 - Solaio copertura
 - Solaio pavimentazione



SISTEMA RISCALDAMENTO

- Caldaia a modulazione, $\eta=96\%$
- Caldaia a condensazione, $\eta=101\%$



SOSTITUZIONE INFISSI

- Telaio alte prestazioni
- DH – Doppio, Alto SHGC
 - DL – Doppio, Basso SHGC
 - TH – Triplo, Alto SHGC
 - TL – Triplo, Basso SHGC



SISTEMA VENTILAZIONE

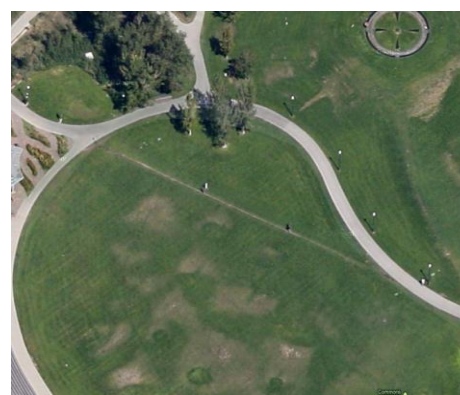
Sistema di ventilazione meccanica con recuperatore di calore

It is a great pleasure and an honor for me to have been asked to welcome you to the National Bureau of Standards today to discuss a subject of mutual interest, namely, that of the effects of energy conservation in buildings on human comfort. With the increased emphasis on energy conservation practices in existing buildings as well as new building designs that emphasize energy conservation, you, our leading scientists, engineers, government officials, architects, physiologists, and manufacturers are faced with the challenge of protecting the comfort, health, and performance of building users. This symposium, therefore, is unusual because we will be trying to explore how much we really know about the effects of interior thermal environments on people.

J. R. Wright
Institute for Applied Technology
National Bureau of Standards
Washington, D.C. 20234

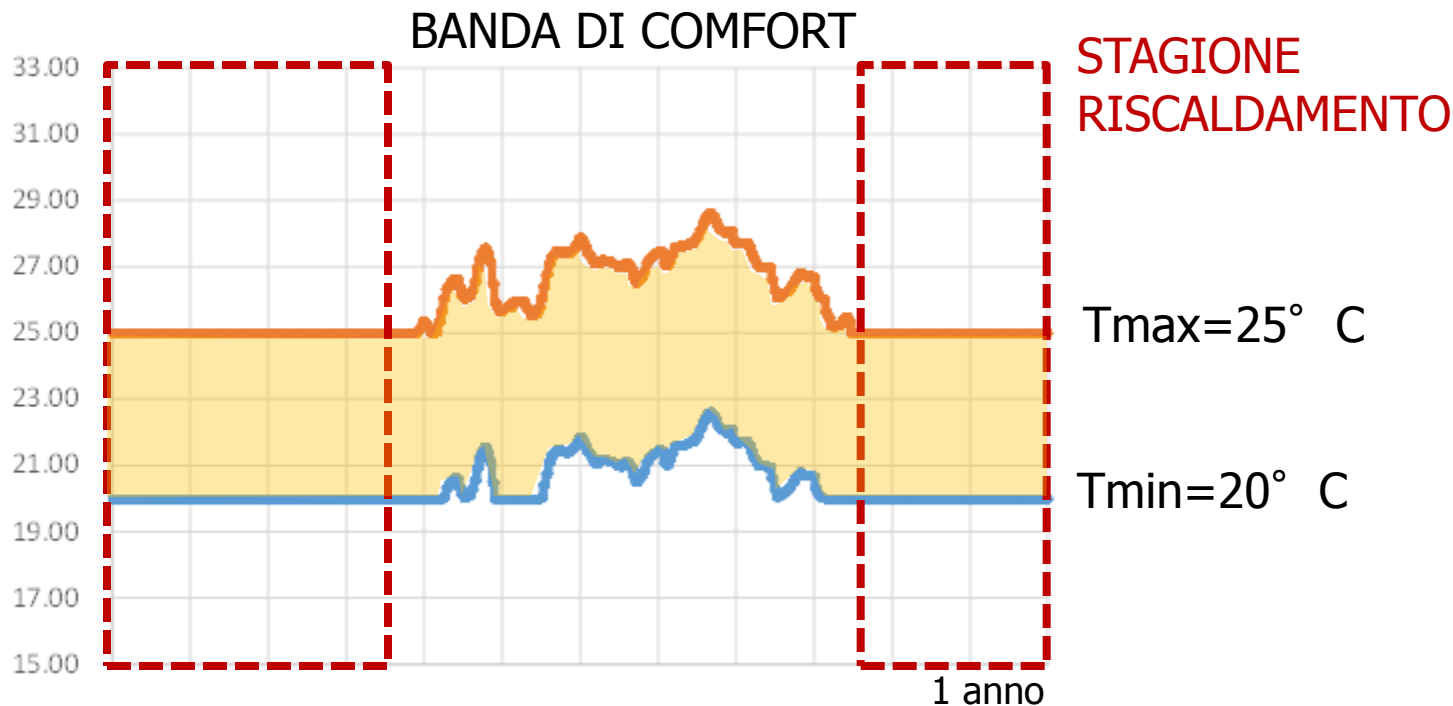
Proceedings of a Symposium Held at the
National Bureau of Standards
Gaithersburg, Maryland
February 11, 1977

Prestazioni



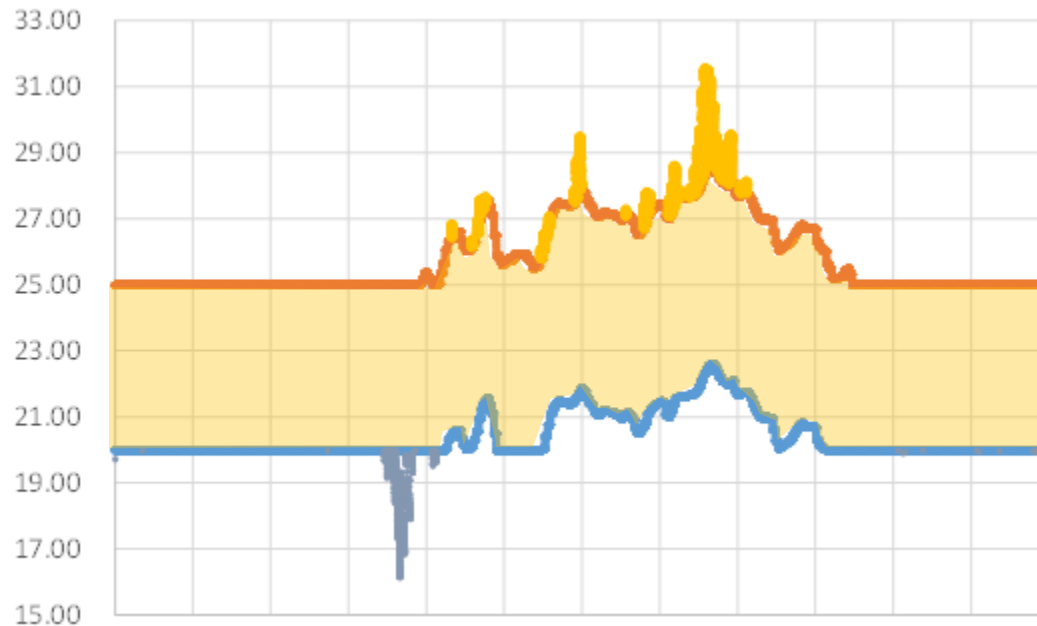
WDT (Weighted Discomfort Time) EN 15251:2007

Di quanto e per quanto tempo la Temperatura operativa é fuori dalla banda di comfort durante il periodo di occupazione



WDT (Weighted Discomfort Time) EN 15251:2007

Di quanto e per quanto tempo la Temperatura operativa é fuori dalla banda di comfort durante il periodo di occupazione

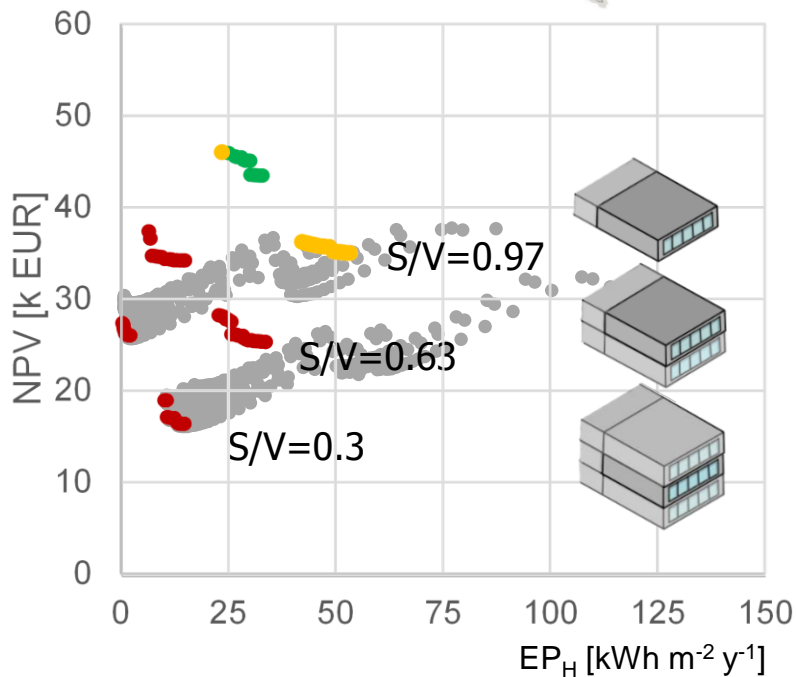


$$wf = T_o - T_{\text{limite}}$$

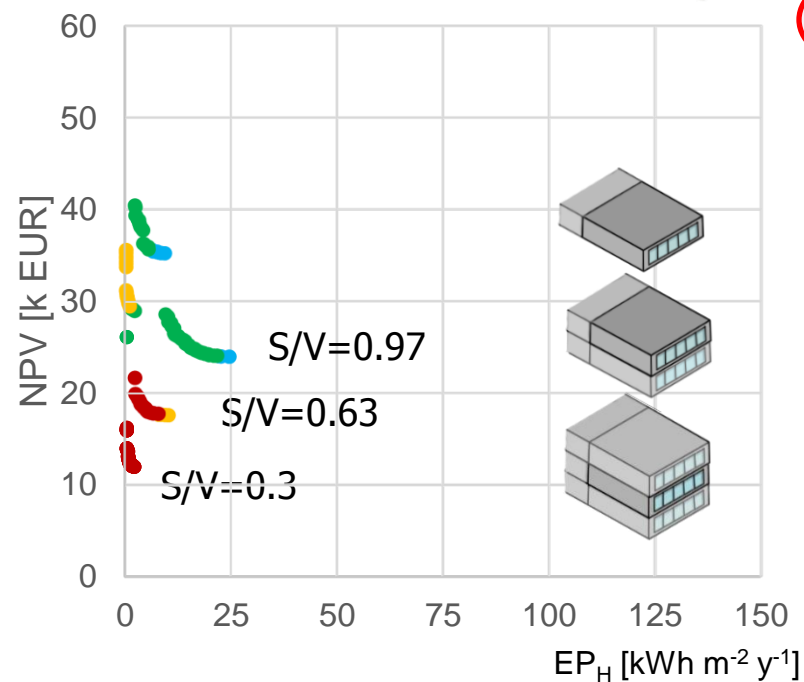
$$WDT = \sum wf * \text{time}$$

Risultati per ottimizzazione EP_H e NPV

MILANO



MESSINA



WDT

4000

3000

2000

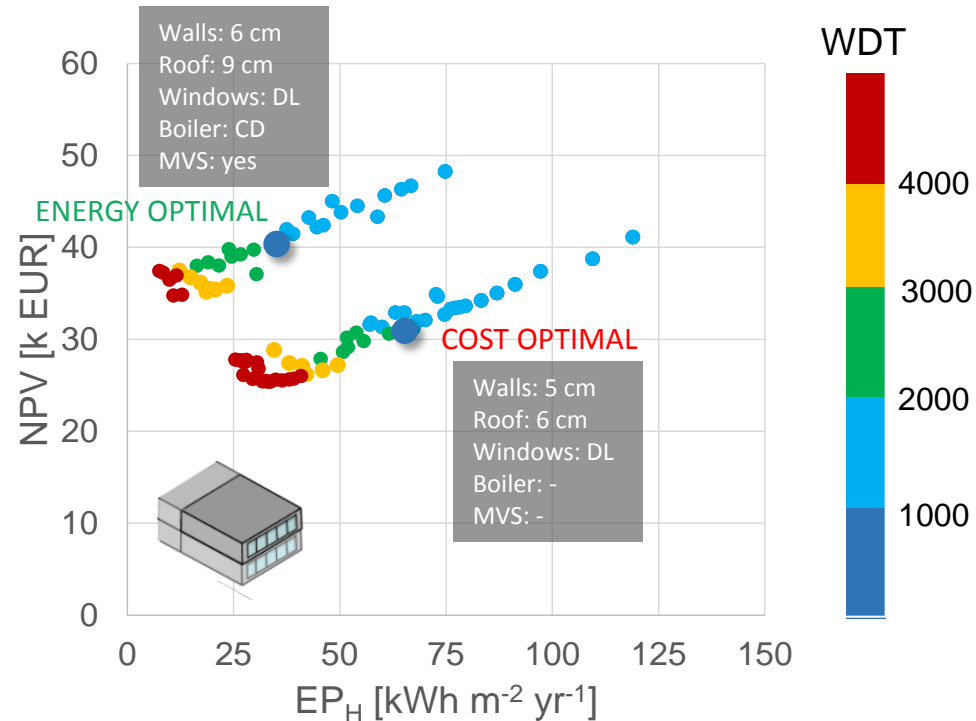
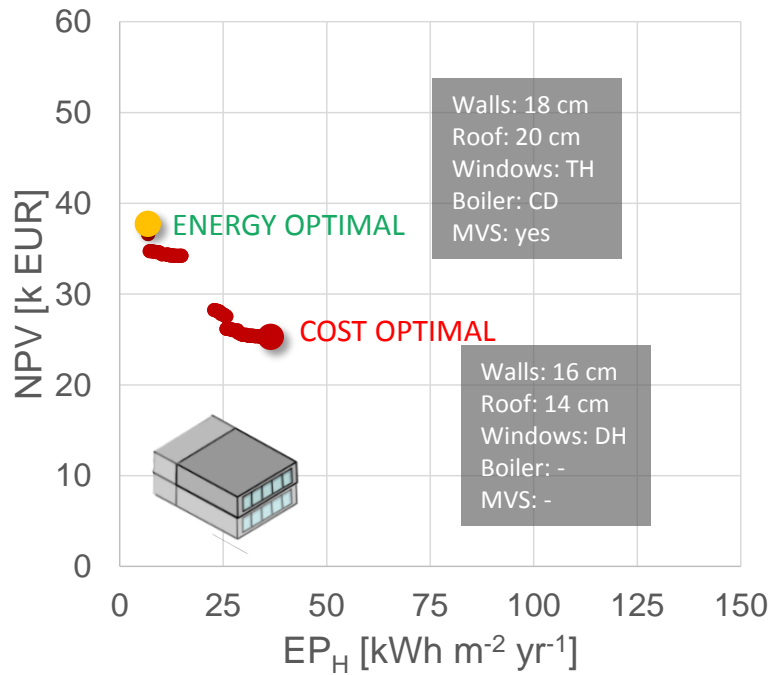
1000

REF 1 - EST

Risultati per ottimizzazione EP_H – NPV - WDT



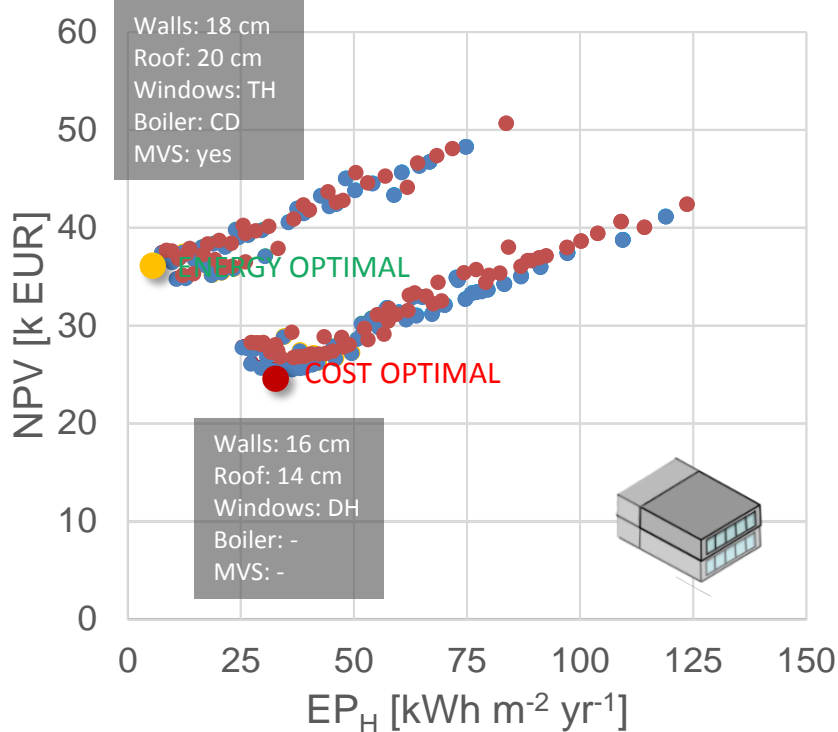
MILANO



REF 1 – EST – S/V = 0.63

Risultati

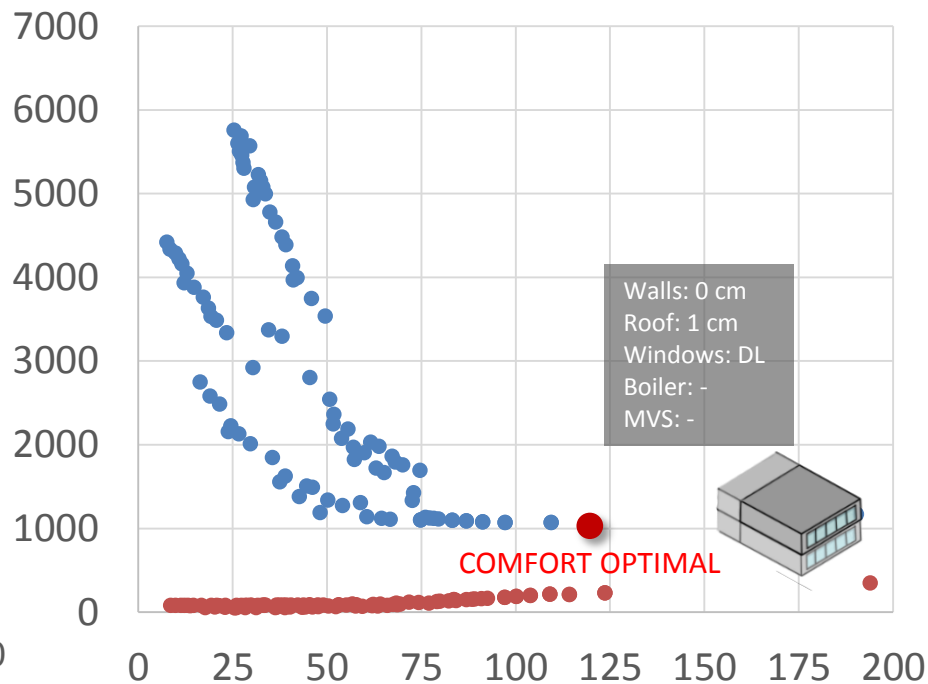
Costi vs Fabbisogno



MILANO

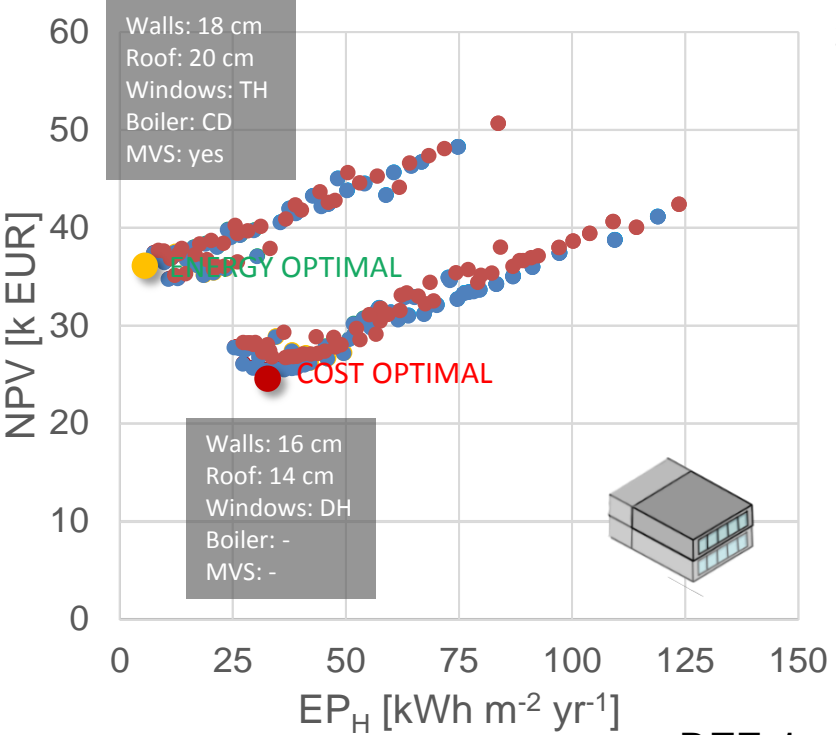


Comfort vs Fabbisogno



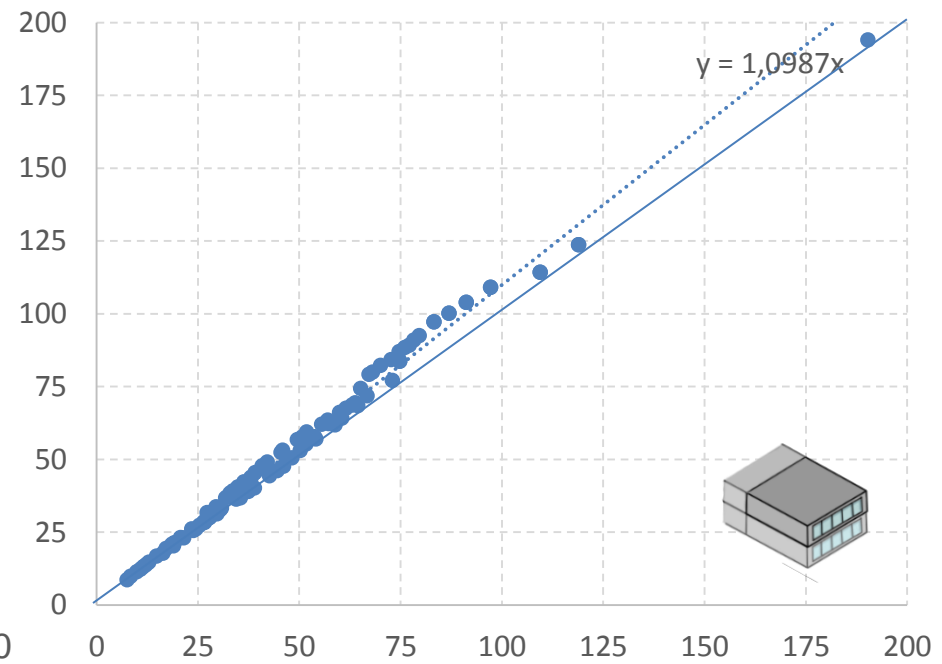
Risultati

Costi vs Fabbisogno



MILANO

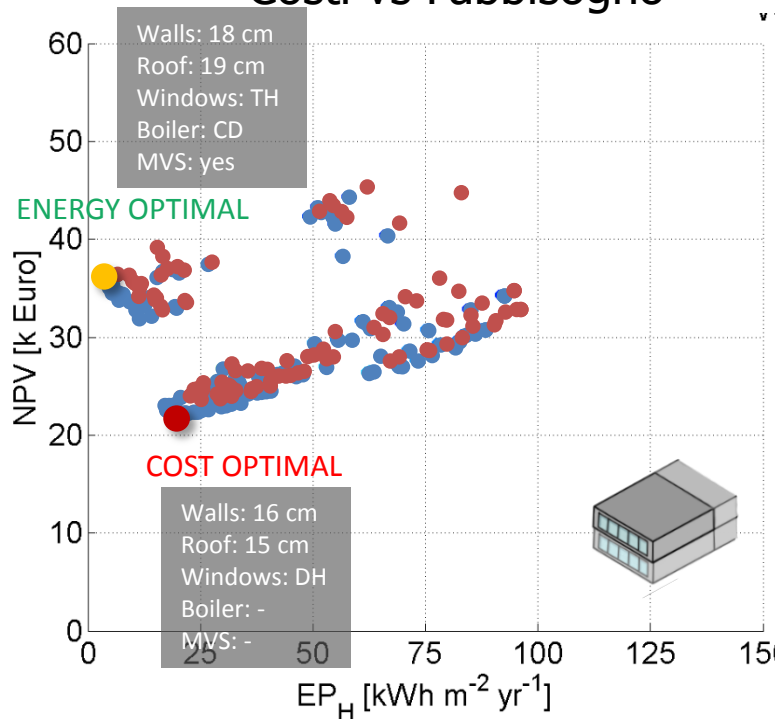
Fabbisogno vs Fabbisogno con gest.



REF 1 – EST – S/V = 0.63

Risultati

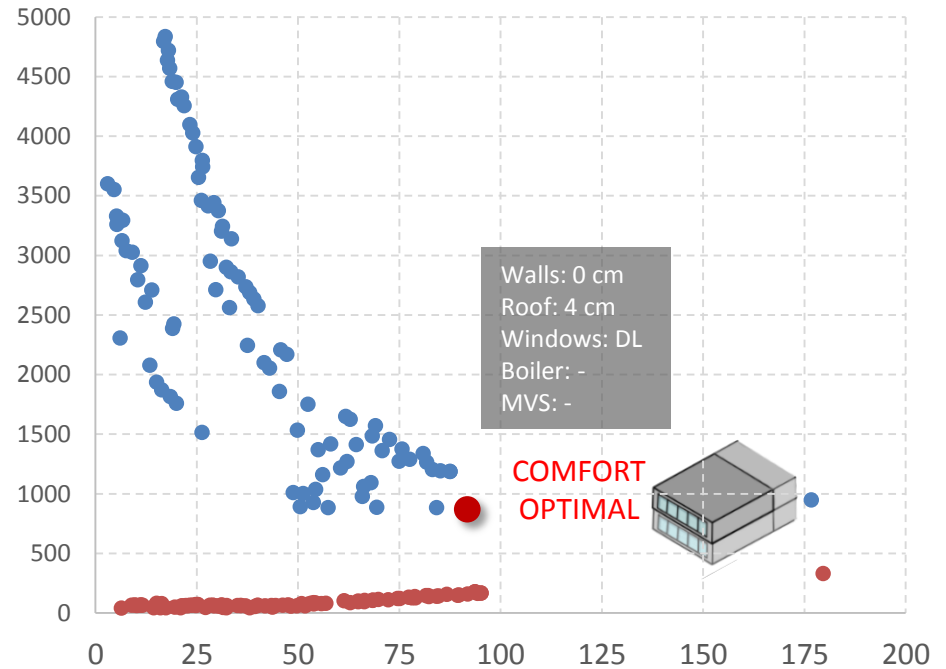
Costi vs Fabbisogno



MILANO



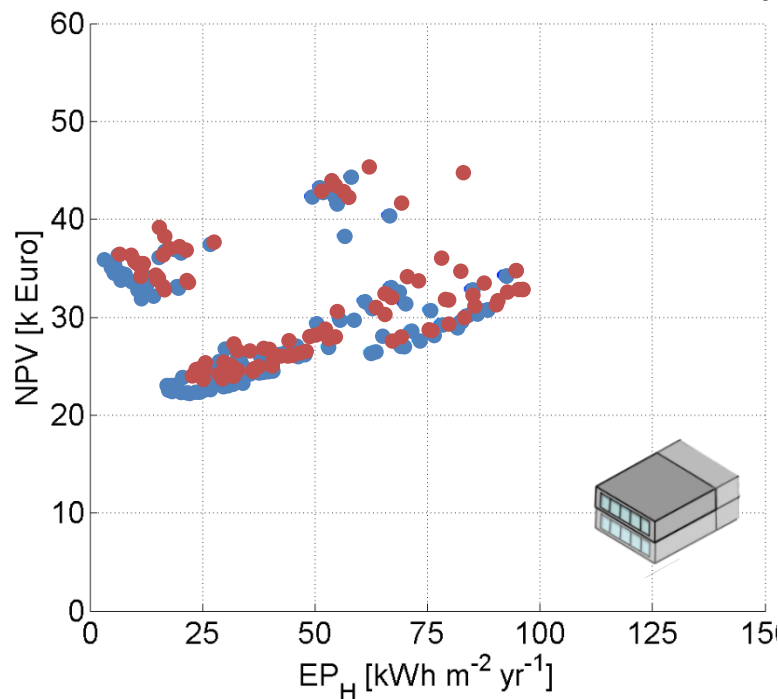
Comfort vs Fabbisogno



REF 1 – SUD – S/V = 0.63

Risultati

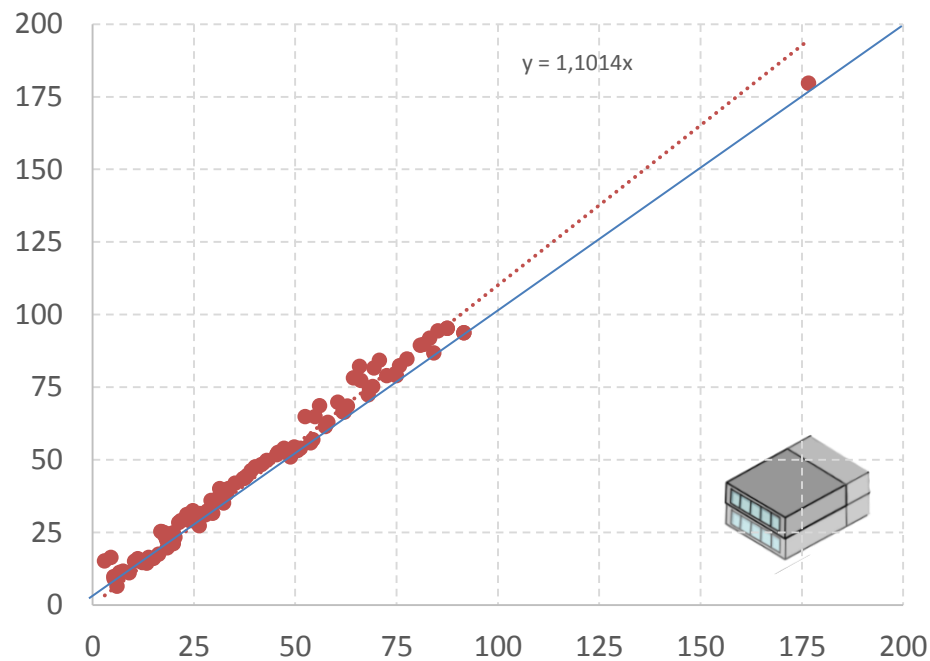
Costi vs Fabbisogno



MILANO



Fabbisogno vs Fabbisogno con gest.



REF 1 – SUD – S/V = 0.63

„Smart“ design

Michigan
State
University

