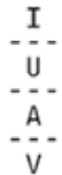


Biennial International Workshop Advances in Energy Studies 2017  
BIWAES 2017

The process of integrated energetic and environmental  
audit on historic buildings



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# The context

**Historic buildings**

+

**Energy retrofitting**



Improvement  $\neq$

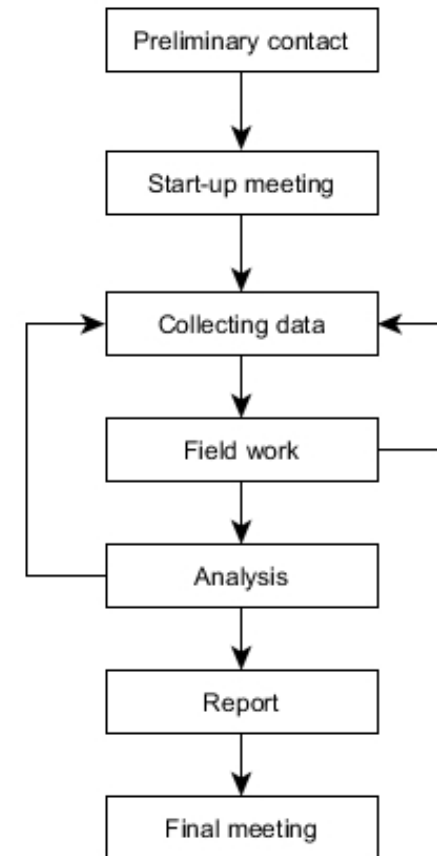
Adaptation to  
standards



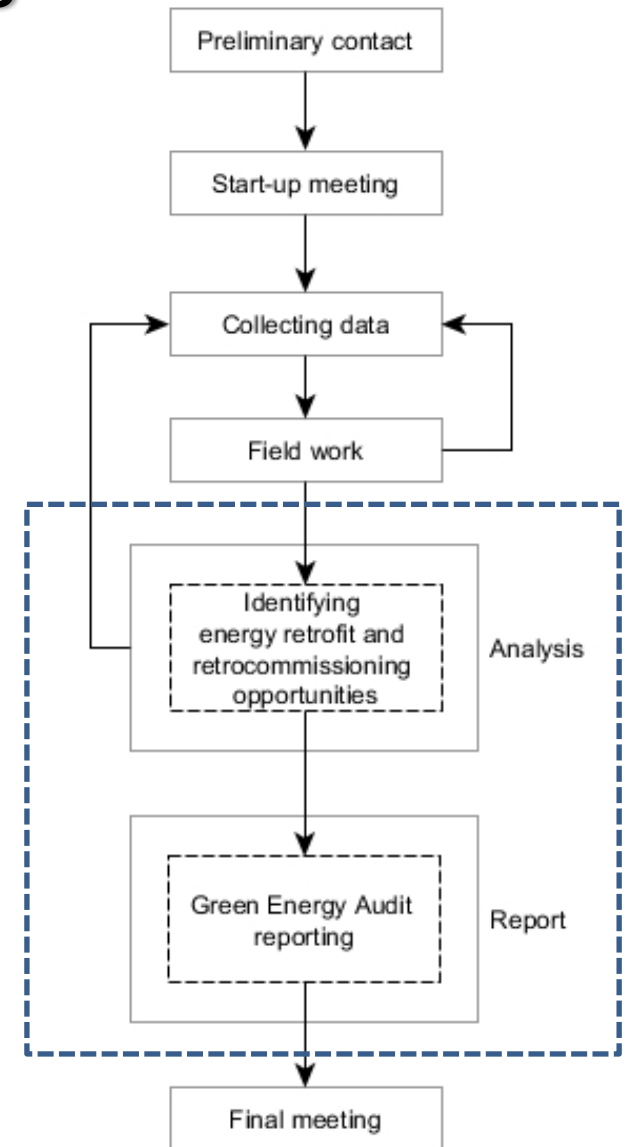
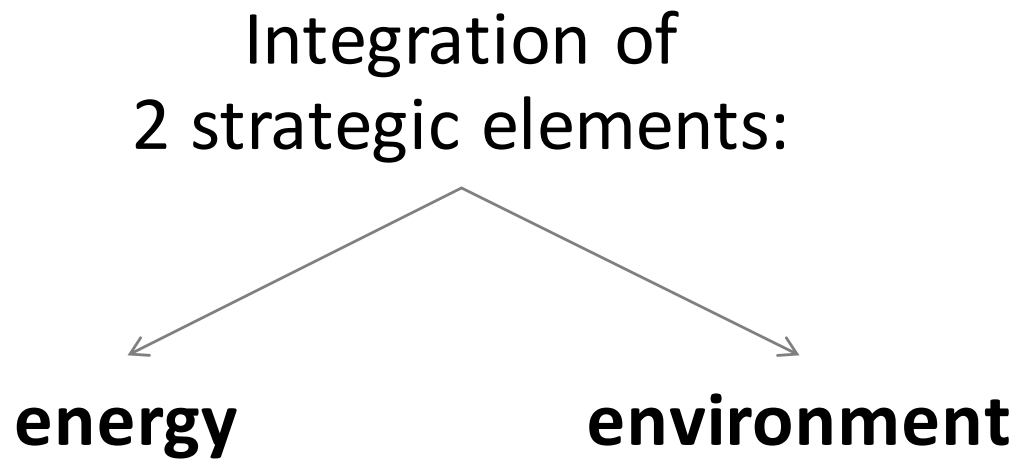
Energy and environmental diagnosis  
and simulations

# Standard process

## UNI CEI EN 16247

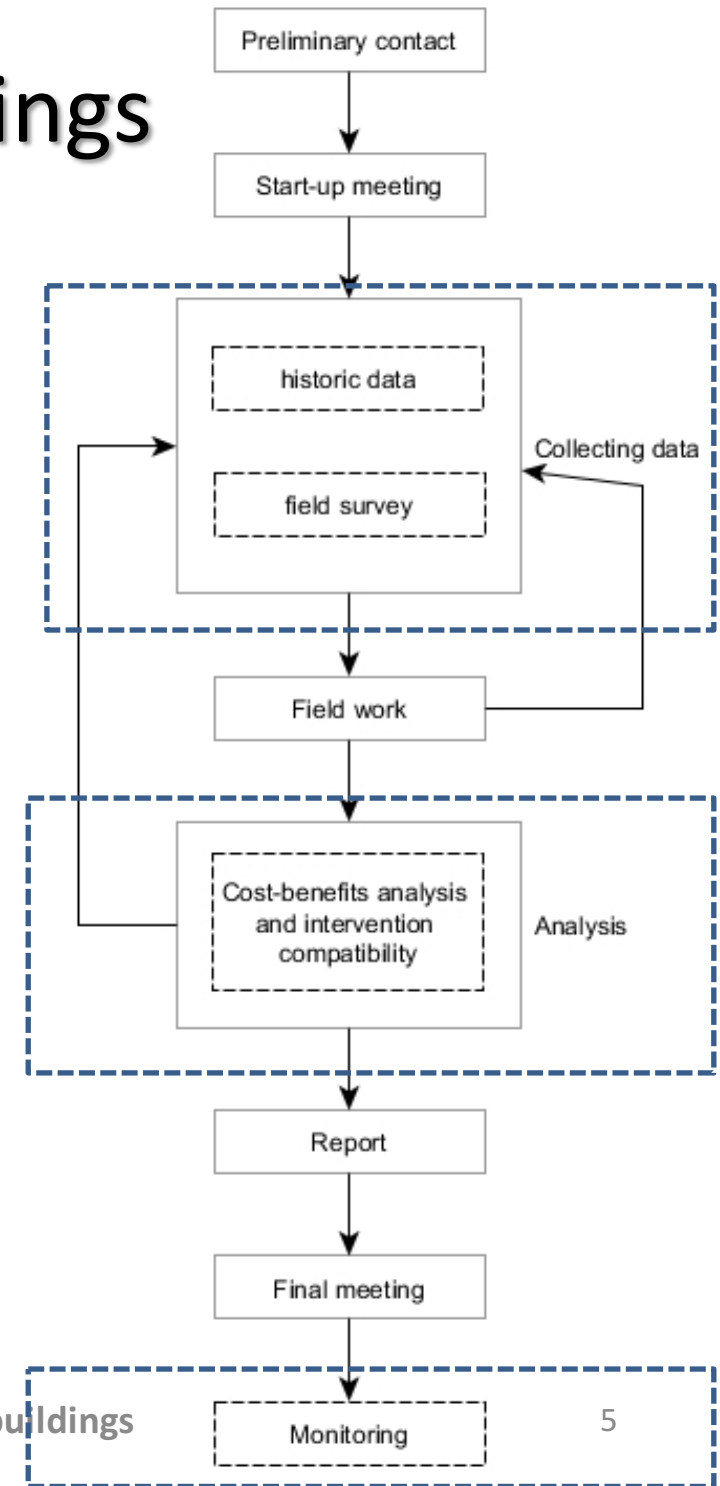
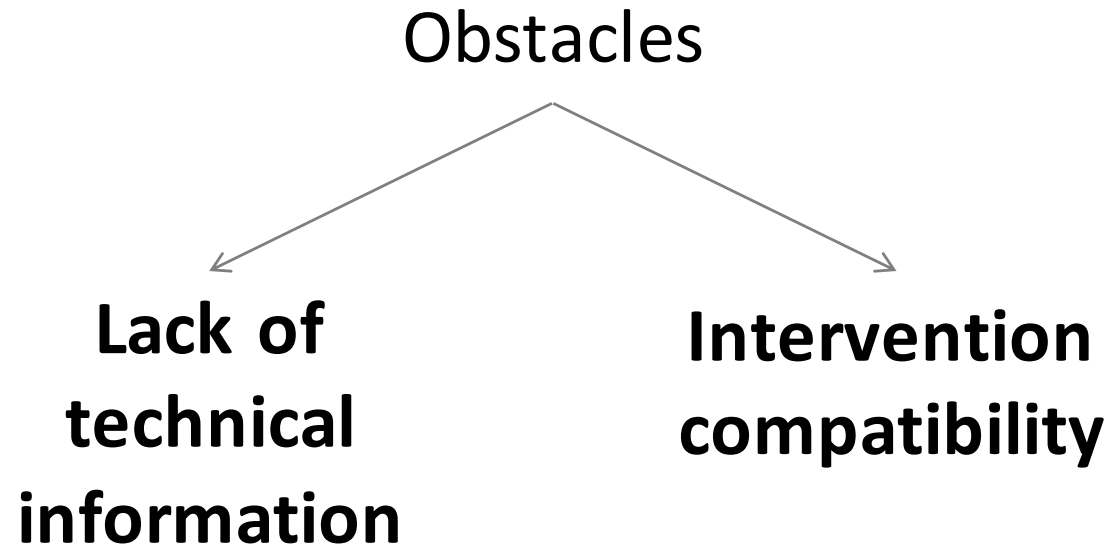


# The Green Energy Audit process



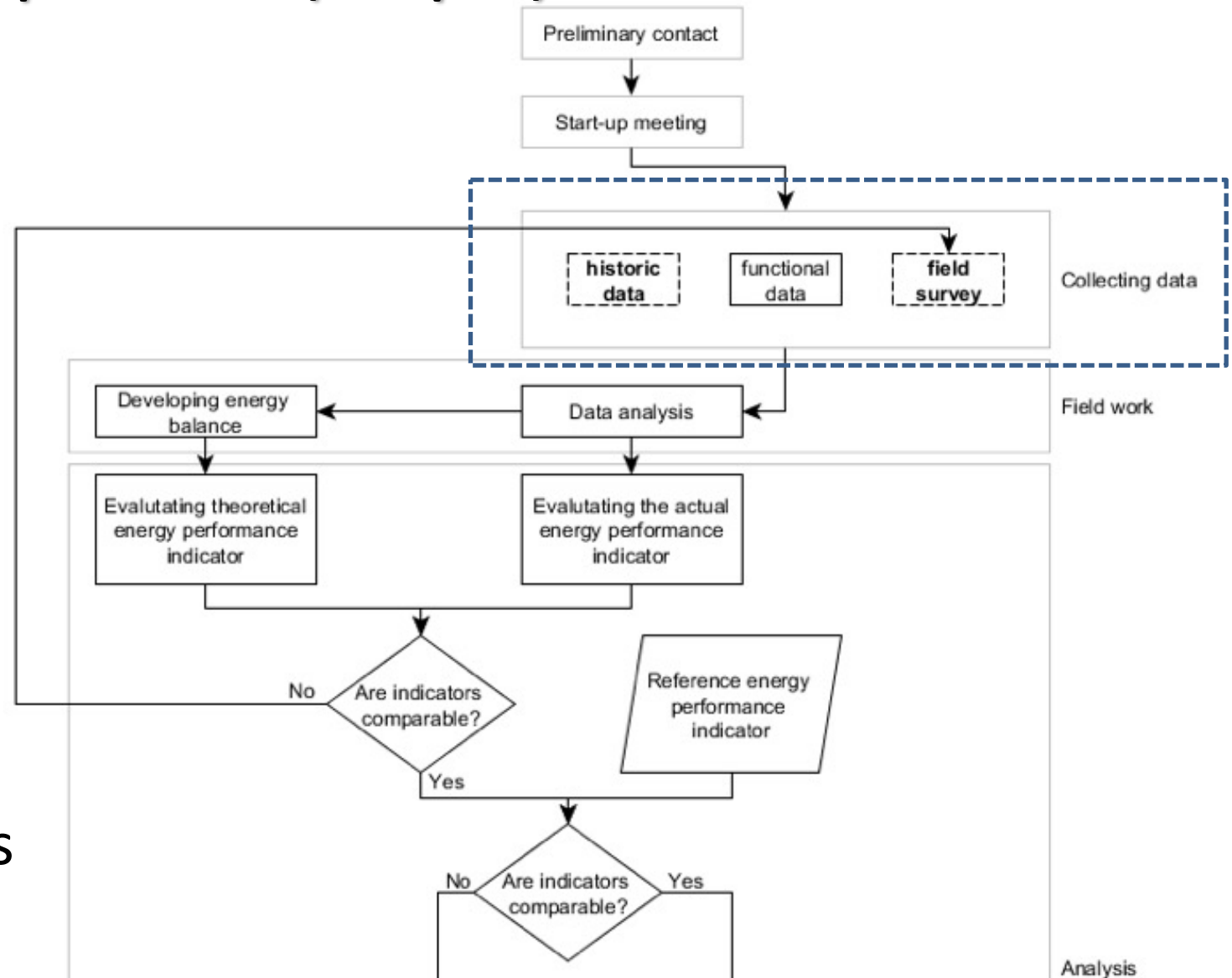
**Giuliano Dall'O', «The Green Energy Audit»**

# Case studies on historic buildings



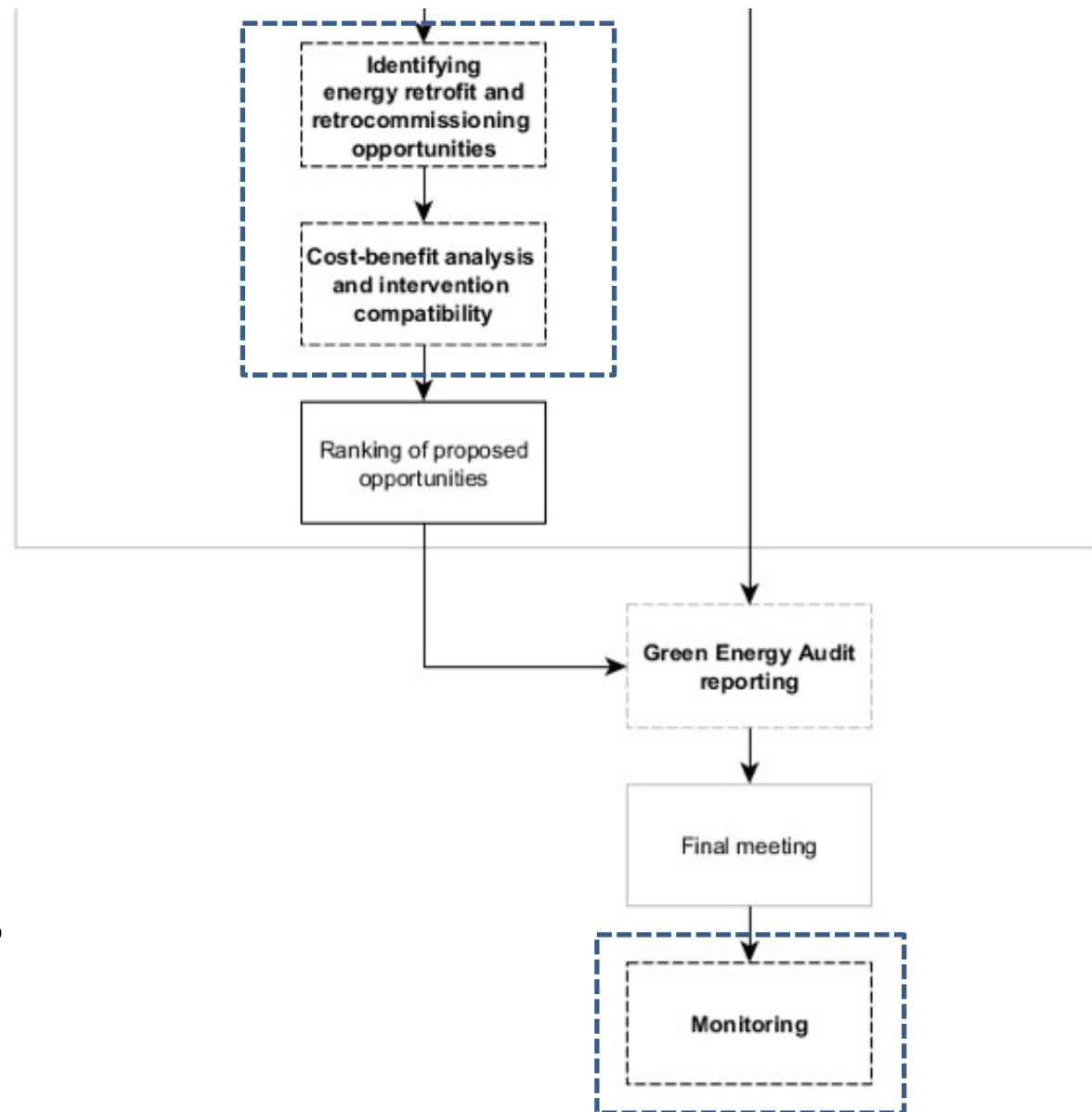
# Proposal of process (step 1)

UNI CEI EN  
16247  
+  
Green Energy  
Audit  
+  
Experiences of  
energy audit on  
historic buildings



# Proposal of process (step 2)

UNI CEI EN  
16247  
+  
Green Energy  
Audit  
+  
Experiences of  
energy audit on  
historic buildings



# Conclusion

UNI CEI EN  
16247  
+  
Green Energy  
Audit  
+  
Experiences of  
energy audit on  
historic buildings



Ca' Rezzonico  
18th Century museum  
Venice



# Conclusion

Descrizione: Muratura interna 52m

Tipologia: Parete interna

Verifica termogrignetrica

Descrizione (dall'interno verso l'esterno)	R [m <sup>2</sup> K/W]	s [cm]
Resistenza superficiale interna	0,130	
Intonaco di calce e gesso	0,029	2,0
Mattone pieno di laterizio (250*120*50) spessore 120	0,150	12,0
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Mattone pieno di laterizio (250*120*50) spessore 120	0,150	12,0
Intonaco di calce e gesso	0,029	2,0
Resistenza superficiale esterna	0,130	
<b>Totale:</b>	<b>0,918</b>	<b>52,0</b>

U calcolata: 1,089 W/m<sup>2</sup>K  Trasmissione fornita dal produttore

U adottata: 1,089 W/m<sup>2</sup>K

Massa superficiale: 864,00 kg/m<sup>2</sup>

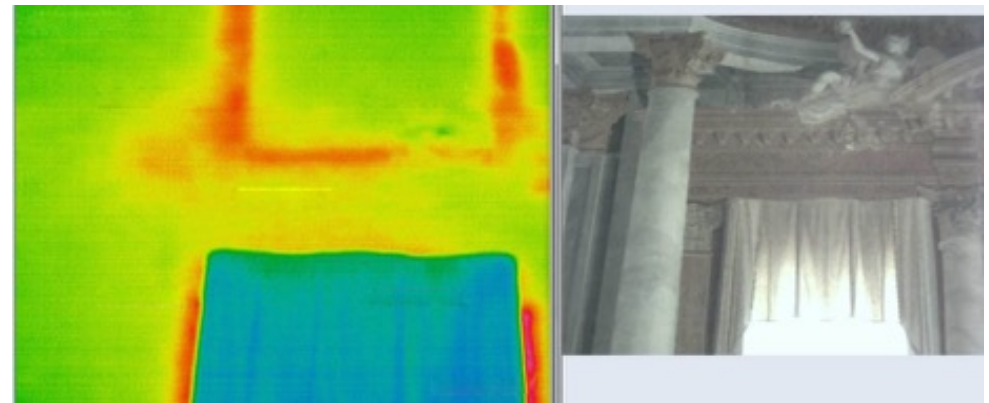
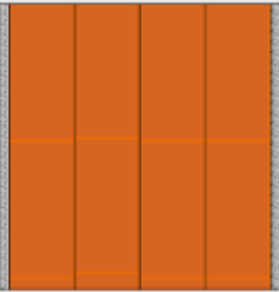
**Valori calcolati**

Trasmissione periodica: 0,059 W/m<sup>2</sup>K

Sfasamento: 16,75 h

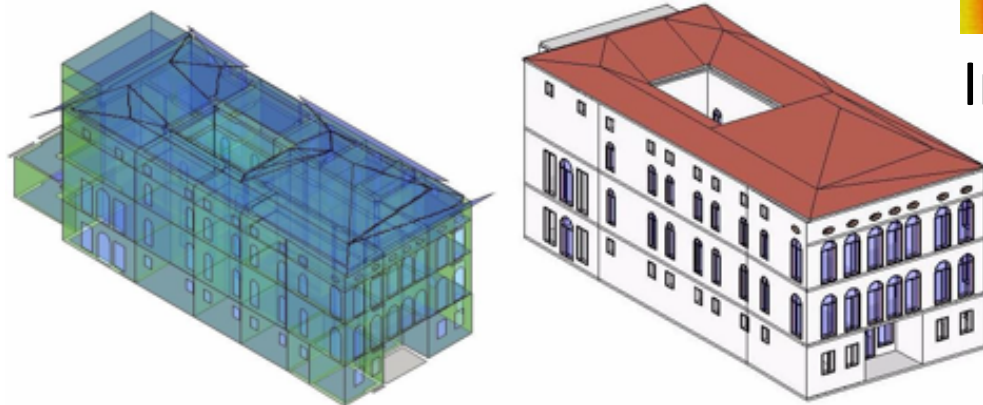
Smorzamento: 0,054

Capacità termica interna: 61,555 kJ/m<sup>2</sup>K



Energy analyses of stratigraphies

Infrared thermography



BIM and energy model

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