



# Energy Performance of the Opaque Ventilated Facade

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# INTRODUCTION



Active envelope system

## Characterization of the Opaque Ventilated Facade

Sample



Building Simulation



# TEST & SAMPLE

Requirements to get a proper Thermal Characterization of an Active Façade

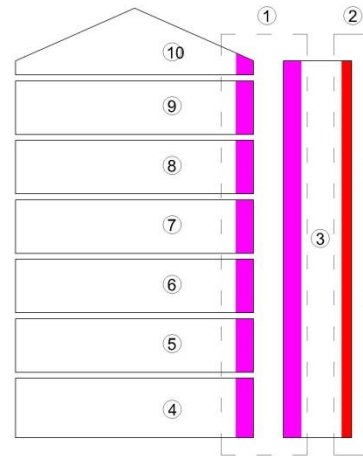
- Reliable Equipment
- Representative Sample
- Confident Process  
Calculation and Analysis

PALINK CELLS and  
TEST METHODOLOGY



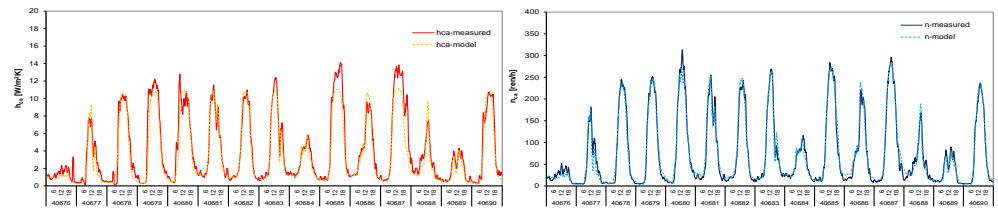
# BUILDING SIMULATION

Simulation Software

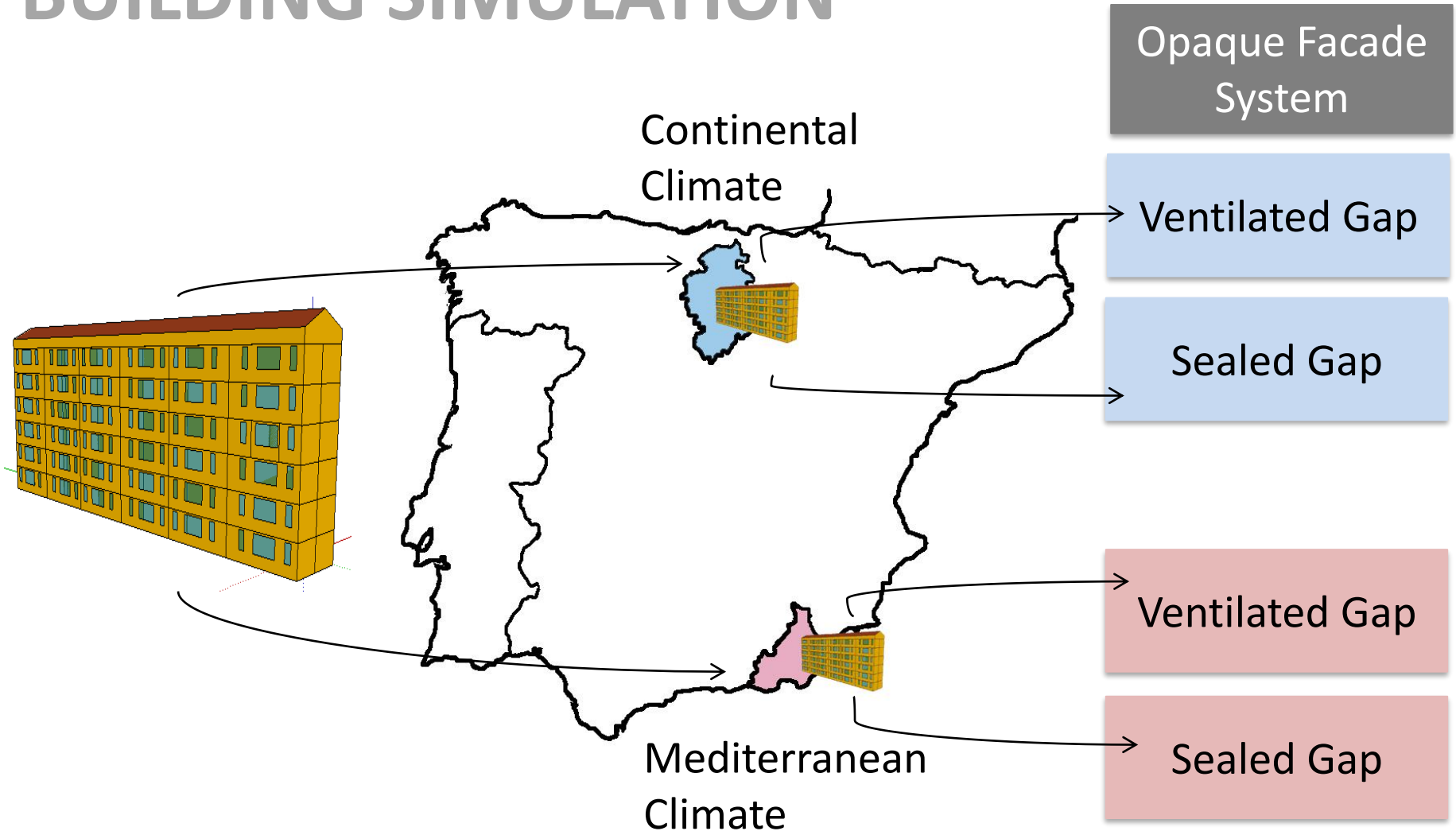


Air Gap =  
Thermal  
Zone



Mathematical Model



# BUILDING SIMULATION



# RESULTS: COOLING EFFECT

	MEDITERRANEAN CLIMATE		CONTINENTAL CLIMATE	
	Heating Demand [kWh/m <sup>2</sup> ]	Cooling Demand [kWh/m <sup>2</sup> ]	Heating Demand [kWh/m <sup>2</sup> ]	Cooling Demand [kWh/m <sup>2</sup> ]
Refurbished building with ventilated gap	<b>2,21</b>	<b>40,99</b>	<b>37,49</b>	<b>25,48</b>
Refurbished building with sealed gap	1,24	44,82	34,77	26,73
Without refurbishment	27,12	32,23	115,33	12,57

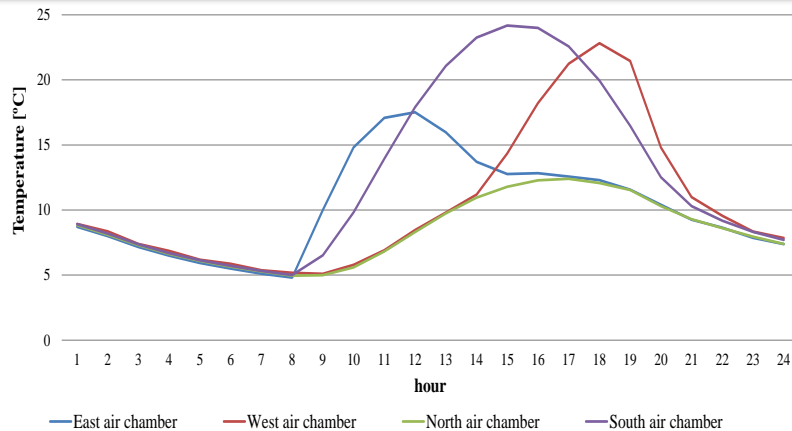
The Ventilated Facade has a cooling effect in the building

# EVACUATED HEAT USE

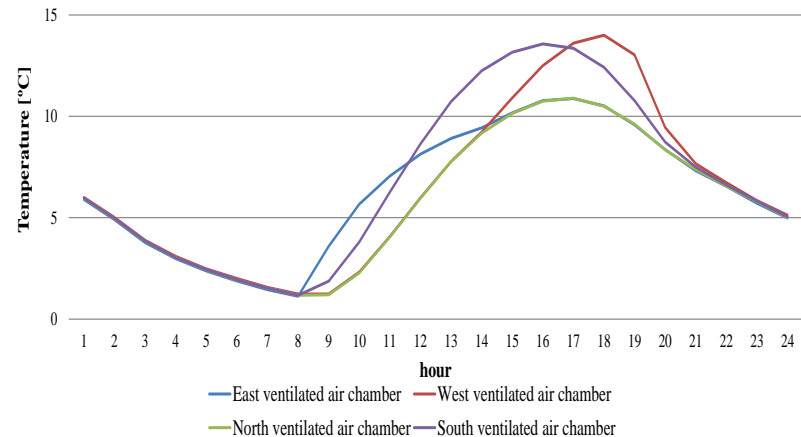
The heat is evacuated by convection

Possibility to use this energy circulating it into the dwellings

## Active facades



Sealed Gap



Ventilated Gap

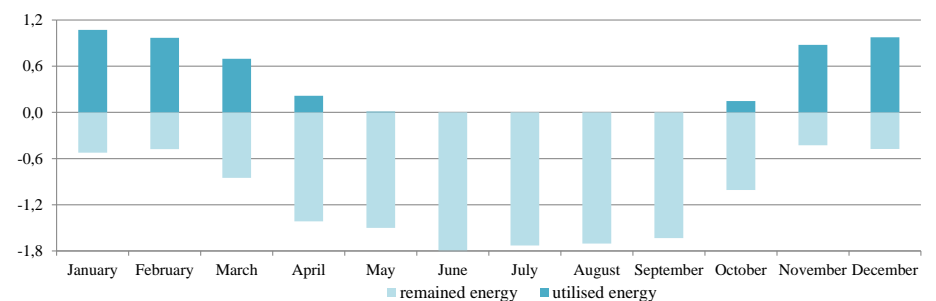
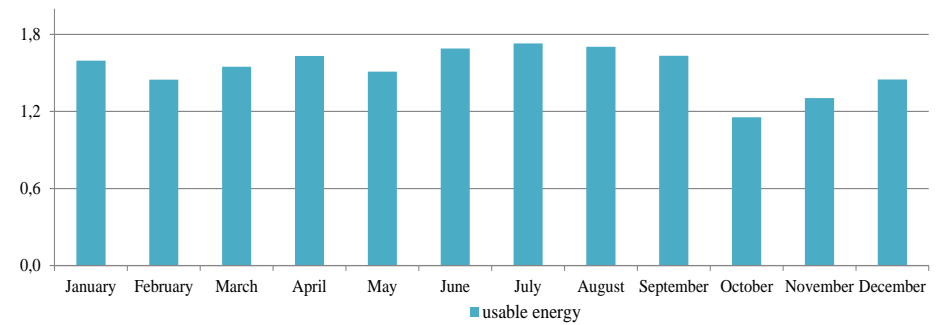
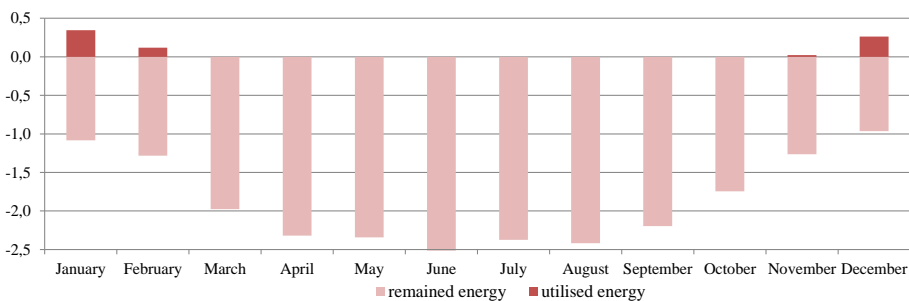
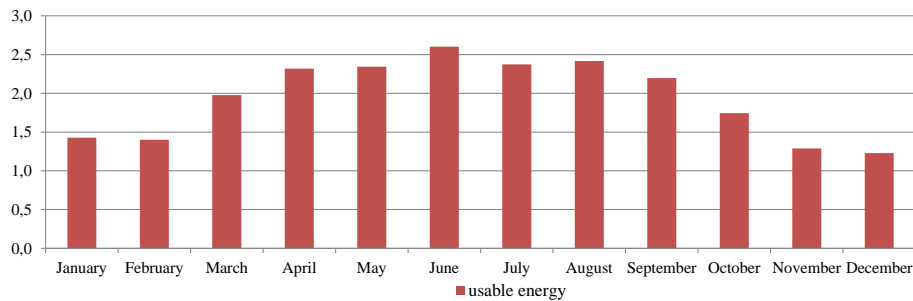
# QUANTIFYING USABLE ENERGY

Mediterranean Climate

23,31 kWh/m<sup>2</sup> year

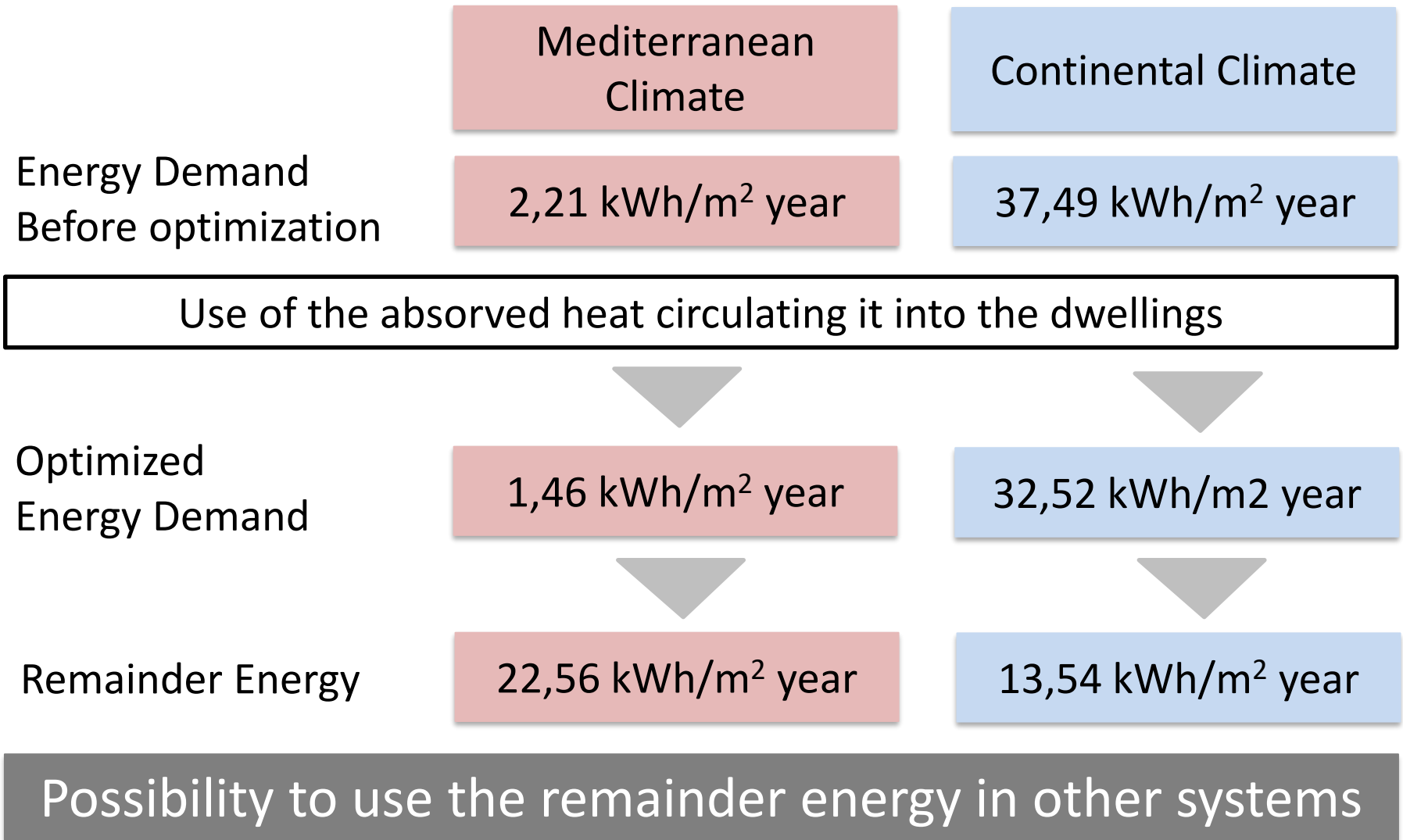
Continental Climate

18,51 kWh/m<sup>2</sup> year

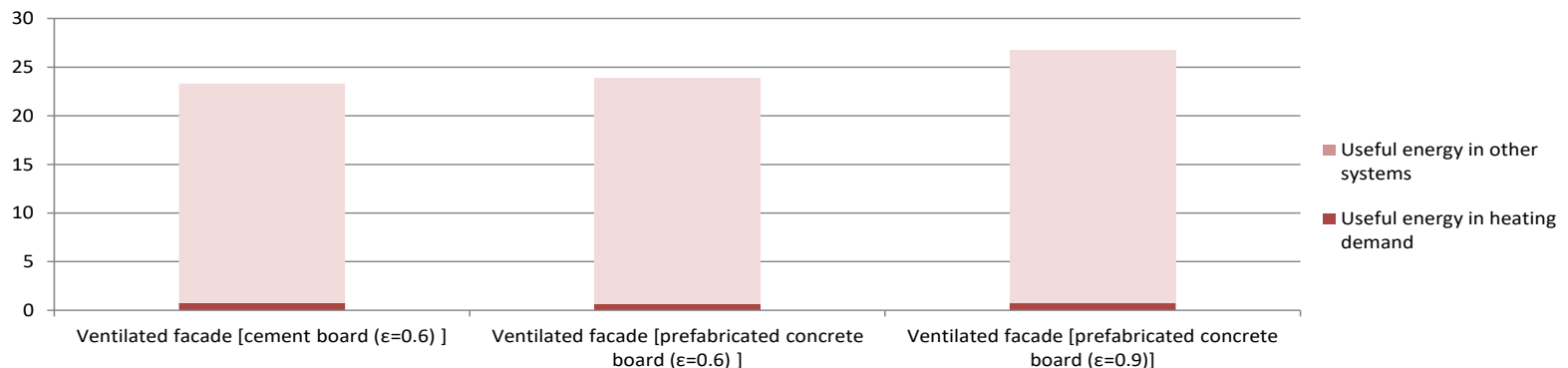
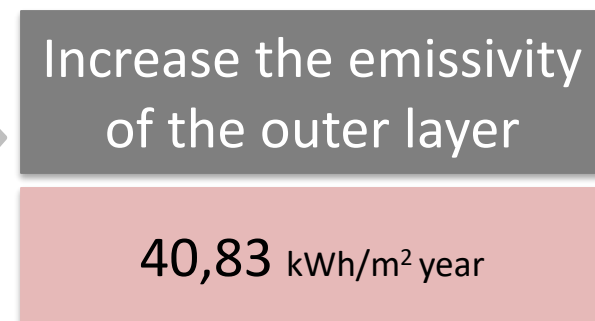
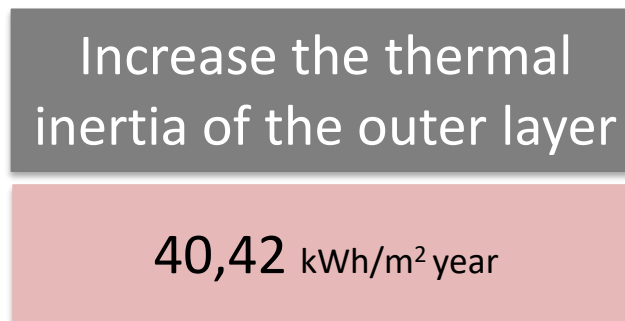
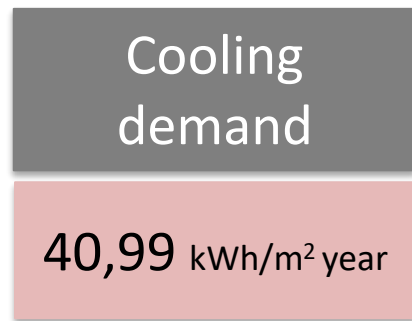
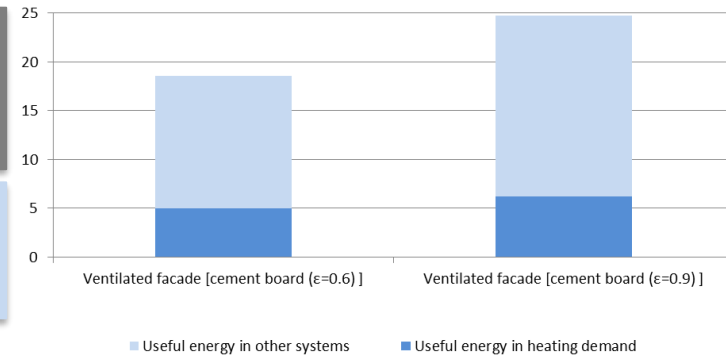
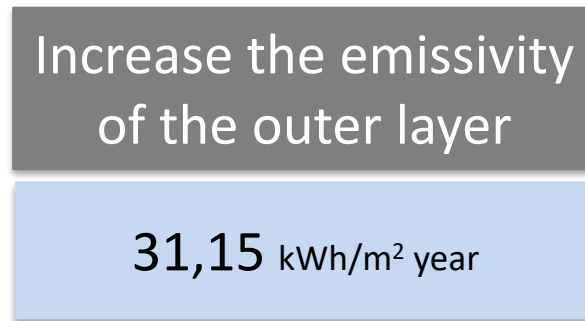
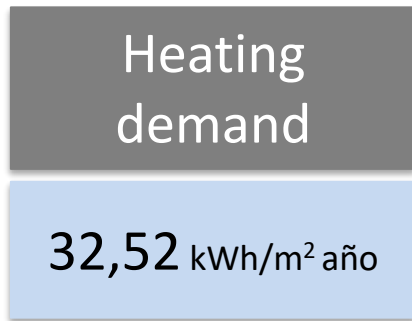




# OPTIMIZED HEATING ENERGY DEMAND



# GUIDELINES FOR THE OPTIMIZATION



# FUTURE LINE OF RESEARCH

Sample

Building Simulation

Building monitoring



Thank you for your attention