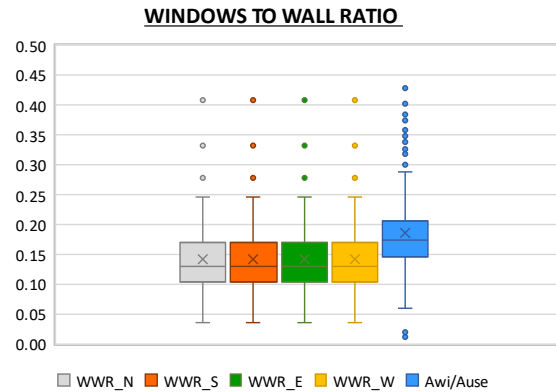
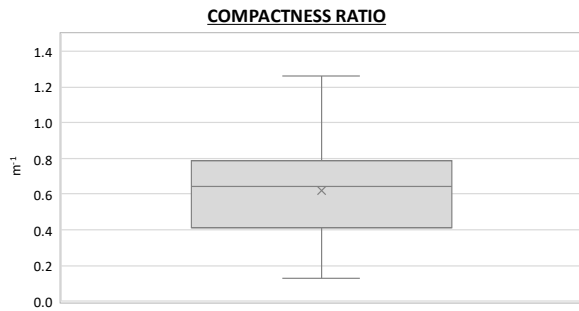


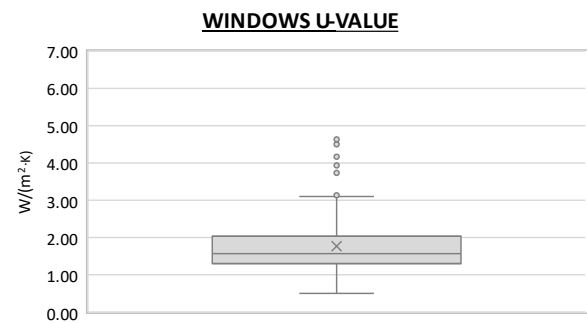
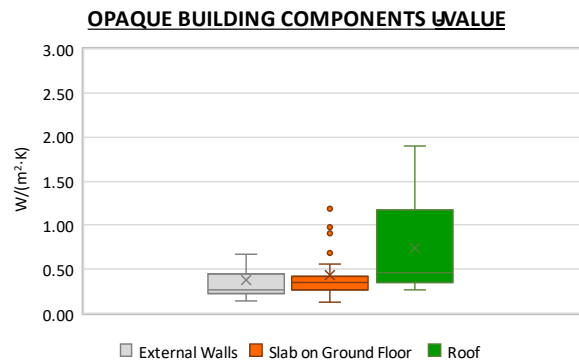
|   |  |   |                       |                             |                    |                     |   |                     |
|---|--|---|-----------------------|-----------------------------|--------------------|---------------------|---|---------------------|
| Region:   | Aosta Valley (Aosta, Quart, Saint-Christophe, and Sarre)   |   |                       |                             |                    |                     | Archetype code:<br>RES_APPBLOCK_2006-<br>_E_VAL |                     |
| Building category:  | Residential buildings - Apartments (in multifamily blocks) |   |                       |                             |                    |                     |   |                     |
| Period of construction:   | > 2005   |   |                       |                             |                    |                     |   |                     |
| Climatic zone:  | E  | Number of records:  |                       | 494                         |                    |                     |   |                     |
| Description (the codes associated with walls and slabs refer to the structures described in UNI/TR 11552:2014):<br>External walls: hollow brick masonry with thermal insulation (cod. MCV02).<br>Roof slabs: reinforced concrete floor slab (cod. SOL04). |  |   |                       |                             |                    |                     | Data sources:<br>EPC databases (100%)           |                     |
|   | Data   | Symbol  | Unit of measure       | Mean value                  | Standard deviation | Q1 (first quartile) | Median value                                    | Q3 (third quartile) |
| BUILDING GEOMETRY   | Number of floors   | $n_f$   | -                     | -                           | -                  | -                   | -   | -                   |
|   | Gross height   | $H_g$   | m                     | -                           | -                  | -                   | -   | -                   |
|   | Footprint area   | $A_{\text{footprint}}$  | m <sup>2</sup>        | -                           | -                  | -                   | -   | -                   |
|   | Heated gross floor area                                    | $A_{H,g}$   | m <sup>2</sup>        | -                           | -                  | -                   | -   | -                   |
|   | Heated net floor area                                      | $A_{H;n}$   | m <sup>2</sup>        | -                           | -                  | -                   | -   | -                   |
|   | Heated gross volume  | $V_{H,g}$   | m <sup>3</sup>        | -                           | -                  | -                   | -   | -                   |
|   | Heated net volume  | $V_{H;n}$   | m <sup>3</sup>        | -                           | -                  | -                   | -   | -                   |
|   | Compactness ratio  | $A_{\text{env}}/V_{H,g}$  | m <sup>-1</sup>       | 0.62                        | 0.24               | 0.41                | 0.64  | 0.79                |
|   | WWR – North orientation                                    | $WWR_N$   | -                     | 0.14                        | 0.06               | 0.10                | 0.13  | 0.17                |
|   | WWR – South orientation                                    | $WWR_S$   | -                     | 0.14                        | 0.06               | 0.10                | 0.13  | 0.17                |
|   | WWR – East orientation                                     | $WWR_E$   | -                     | 0.14                        | 0.06               | 0.10                | 0.13  | 0.17                |
|   | WWR – West orientation                                     | $WWR_W$   | -                     | 0.14                        | 0.06               | 0.10                | 0.13  | 0.17                |
|   | Window to useful floor area ratio                          | $A_{wi}/A_{\text{use}}$   | -                     | 0.19                        | 0.09               | 0.15                | 0.17  | 0.21                |
| ENVELOPE  | Roof type  | -   |                       |                             |                    |                     |   |                     |
|   | U-value of the roof **                                     | $U_{fi,up}$   | W/(m <sup>2</sup> ·K) | 0.74                        | 0.49               | 0.34                | 0.46  | 1.17                |
|   | External walls type  | Hollow brick masonry: 66%; Solid Brick masonry: 27%; Unknown: 5%; Prefabricated panels: 1%; Concrete wall: 1%   |                       |                             |                    |                     |   |                     |
|   | U-value of the wall  | $U_{wl}$  | W/(m <sup>2</sup> ·K) | 0.38                        | 0.25               | 0.23                | 0.27  | 0.44                |
|   | Slab on ground floor type                                  | -   |                       |                             |                    |                     |   |                     |
|   | U-value of the floor **                                    | $U_{fi,lw}$   | W/(m <sup>2</sup> ·K) | 0.43                        | 0.27               | 0.27                | 0.35  | 0.42                |
|   | Windows type   | Double glazing, wooden frame: 86%; Double glazing, PVC frame: 10%; Triple glazing, PVC frame: 2%; Triple glazing, wooden frame: 2%  |                       |                             |                    |                     |   |                     |
|   | U-value of the windows                                     | $U_W$   | W/(m <sup>2</sup> ·K) | 1.75                        | 0.66               | 1.31                | 1.56  | 2.03                |
|   | Shading system type  | -   |                       |                             |                    |                     |   |                     |
| GAINS and VENTILATION   | Occupancy density *  | $O_C$   | person/m <sup>2</sup> | UNI EN 16798-1 - Table A.19 |                    |                     |   |                     |
|   | Lighting power density *                                   | $W_L$   | W/m <sup>2</sup>      | UNI EN 16798-1 - A.8.3      |                    |                     |   |                     |
|   | Equipment power density *                                  | $W_A$   | W/m <sup>2</sup>      | UNI EN 16798-1 - A.8.3      |                    |                     |   |                     |
|   | Type of ventilation  | Natural: 100%   |                       |                             |                    |                     |   |                     |
|   | Air exchange rate *  | $n$   | h <sup>-1</sup>       | 0.30                        | 0.00               | 0.30                | 0.30  | 0.30                |
| THERMAL SYSTEMS   | Heating system type  | Autonomous: 62%; Centralized: 38%   |                       |                             |                    |                     |   |                     |
|   | Heating generator  | Boiler (unknown type): 32%; Condensing Boiler: 24%; Traditional Boiler: 14%; Air-source heat pump: 12%; Heat exchanger of district heating/cooling: 10%; Water-source heat pump: 4%; Unknown: 2%; Fireplace: 2% |                       |                             |                    |                     |   |                     |
|   | Daily operating time of the heating system *               | $t_H$   | h                     | 14.0                        | 0.0                | 14.0                | 14.0  | 14.0                |
|   | Energy carrier   | Natural Gas: 73%; District heating: 10%; LPG: 8%; Solid biomass: 6%; Gas Oil: 3%  |                       |                             |                    |                     |   |                     |
|   | Heating emission sub-system                                | -   |                       |                             |                    |                     |   |                     |
|   | Cooling system type  | Absent: 87%; Water-cooled chiller: 5%; Air-cooled chiller: 5%; Unknown: 3%  |                       |                             |                    |                     |   |                     |
|   | Daily operating time of the cooling system *               | $t_C$   | h                     | -                           | -                  | -                   | -   | -                   |
|   | Cooling emission sub-system                                | -   |                       |                             |                    |                     |   |                     |
|   | DHW system type  | Autonomous, coupled with heating: 54%; Centralized, coupled with heating: 33%; Autonomous, detached from heating: 13%   |                       |                             |                    |                     |   |                     |
|   | DHW generator  | Unknown: 43%; Natural gas boiler: 36%; Electric Heat Pump: 16%; Electric boiler: 5%   |                       |                             |                    |                     |   |                     |
| * These values are derived from UNI EN ISO Standards; ** U-values of the upper and lower slabs face unconditioned spaces (i.e., attic, basement, etc.)  |  |   |                       |                             |                    |                     |   |                     |

|                                |  |  |
|--------------------------------|--|--|
| <b>Region:</b>                 | Aosta Valley (Aosta, Quart, Saint-Christophe, and Sarre)   | <b>Archetype code:</b><br>RES_APPBLOCK_2006-<br>_E_VAL |
| <b>Building category:</b>      | Residential buildings - Apartments (in multifamily blocks) |  |
| <b>Period of construction:</b> | > 2005   |  |
| <b>Climatic zone:</b>          | E  |  |
| <b>Number of records:</b>      |  | 494  |

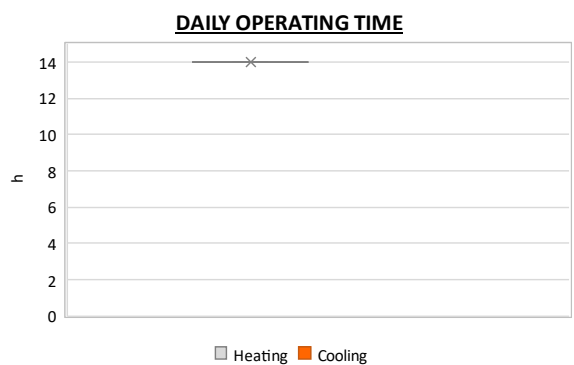
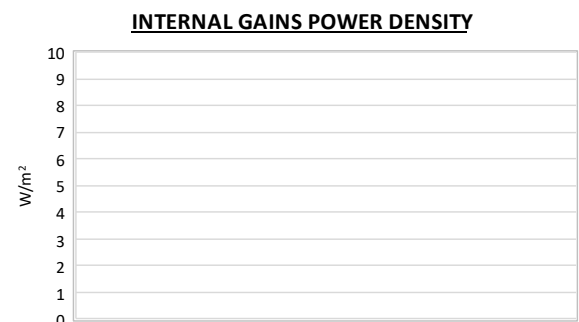
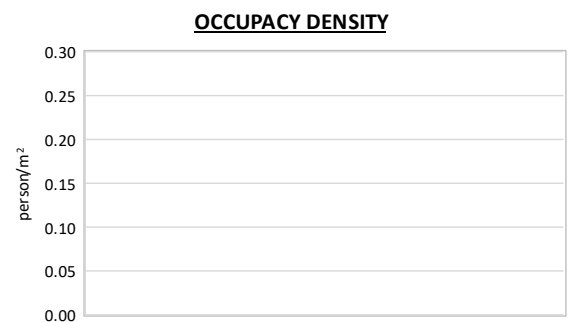
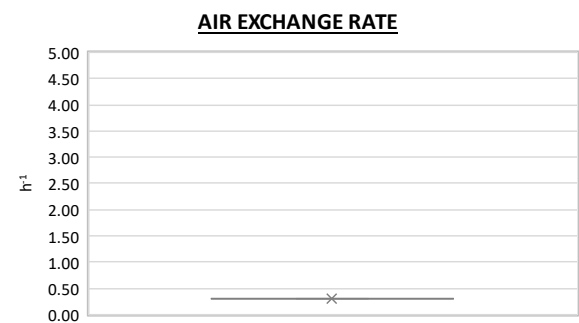
### Numerical variables – GEOMETRY



### Numerical variables – ENVELOPE



### Numerical variables – GAINS, VENTILATION and SYSTEMS USAGE



|                         |  |                    |     |   |
|-------------------------|--|--------------------|-----|---|
| Region:                 | Aosta Valley (Aosta, Quart, Saint-Christophe, and Sarre)   |                    |     | Archetype code:<br>RES_APPBLOCK_2006-<br>_E_VAL |
| Building category:      | Residential buildings - Apartments (in multifamily blocks) |                    |     |   |
| Period of construction: | > 2005   |                    |     |   |
| Climatic zone:          | E  | Number of records: | 494 |   |

| ADDITIONAL DATA                |                                  |                                 |                 |   |                    |                     |              |                     |
|--------------------------------|----------------------------------|---------------------------------|-----------------|---|--------------------|---------------------|--------------|---------------------|
|                                | Data                             | Symbol                          | Unit of measure | Mean value  | Standard deviation | Q1 (first quartile) | Median value | Q3 (third quartile) |
| <b>GEOMETRY:</b><br>apartments | Inter-storey height              | $H_n$                           | m               | 2.7   | 0.2                | 2.6                 | 2.6          | 2.7                 |
|                                | Heated gross floor area          | $A_{H,g}$                       | m <sup>2</sup>  | -   | -                  | -                   | -            | -                   |
|                                | Heated net floor area            | $A_{H,n}$                       | m <sup>2</sup>  | 78.0  | 36.4               | 55.6                | 70.6         | 92.6                |
|                                | Heated gross volume              | $V_{H,g}$                       | m <sup>3</sup>  | 309.2   | 155.6              | 211.1               | 269.3        | 375.6               |
|                                | Heated net volume                | $V_{H,n}$                       | m <sup>3</sup>  | 185.2   | 92.4               | 128.5               | 171.5        | 214.5               |
| <b>THERMAL SYSTEMS</b>         | Heating efficiency or <i>COP</i> | $\eta_{H,gen}$ or $COP_{H,gen}$ | -               | This value has to be retrieved from suitable datasheets |                    |                     |              |                     |
|                                | Total heating power *            | $P_{H,gen}$                     | kW              | 20.5  | 9.7                | 13.0                | 24.0         | 26.6                |
|                                | Cooling efficiency or <i>EER</i> | $\eta_{C,gen}$ or $EER_{C,gen}$ | -               | This value has to be retrieved from suitable datasheets |                    |                     |              |                     |
|                                | Total cooling power *            | $P_{C,gen}$                     | kW              | 11.7  | 12.0               | 2.3                 | 5.2          | 23.9                |
|                                | Temperature of DHW               | $\vartheta_W$                   | °C              | 40.0  | 0.0                | 40.0                | 40.0         | 40.0                |
|                                | DHW system power *               | $P_{W,gen}$                     | kW              | 19.1  | 10.8               | 8.0                 | 23.8         | 26.0                |

\* These values refer to the apartment scale

### Additional data: GEOMETRY (the plots refer to the apartment scale)



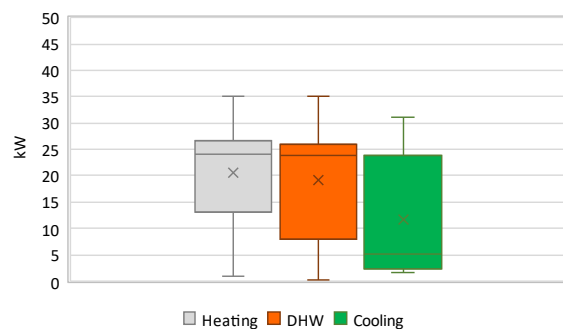
|                                |  |  |
|--------------------------------|--|--|
| <b>Region:</b>                 | Aosta Valley (Aosta, Quart, Saint-Christophe, and Sarre)   | <b>Archetype code:</b><br>RES_APPBLOCK_2006-<br>_E_VAL |
| <b>Building category:</b>      | Residential buildings - Apartments (in multifamily blocks) |  |
| <b>Period of construction:</b> | > 2005   |  |
| <b>Climatic zone:</b>          | E  |  |
| <b>Number of records:</b>      |  | 494  |

### Additional data: other numerical variables that are not included in the archetype

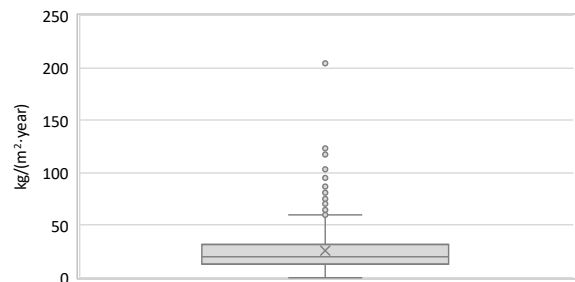
**DHW SUPPLY TEMPERATURE**



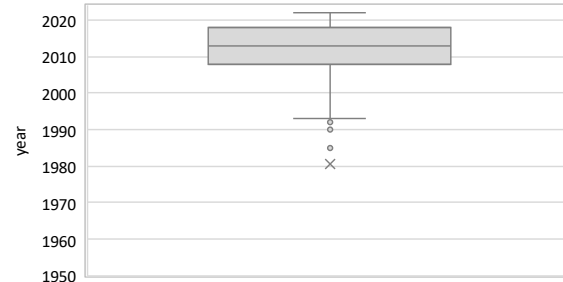
**SYSTEM POWER**



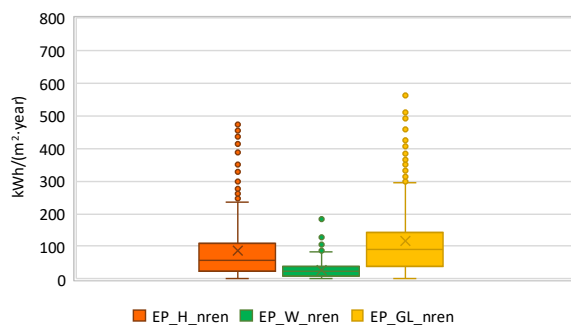
**CO<sub>2</sub> EMISSION**



**HEATING SYSTEM INSTALLATION YEAR**



**NON-RENEWABLE PRIMARY ENERGY USE**



**RENEWABLE PRIMARY ENERGY USE**

