



### Project information

|   |                      |
|---|----------------------|
| Project type:                           | Eco-rehabilitation   |
| Address:                                | Clemos Burgaleta 1,3 |
| End refurbishment year:                 | 2011                 |
| Building type:                          | Blocks of dwellings  |
| Dwellings:                              | 12                   |
| Storeys:                                | 3                    |
| Gross area BTA:                         | 1150 m <sup>2</sup>  |
| Net area:                               | 877 m <sup>2</sup>   |
| Heated area:                            | 978 m <sup>2</sup>   |
| Additional costs* for eco applications: | 66.548 €             |
| Total building costs*:                  | 211.533€             |

\* Not included industrial benefits, overheads and taxes

### Special ECO-technologies applied:

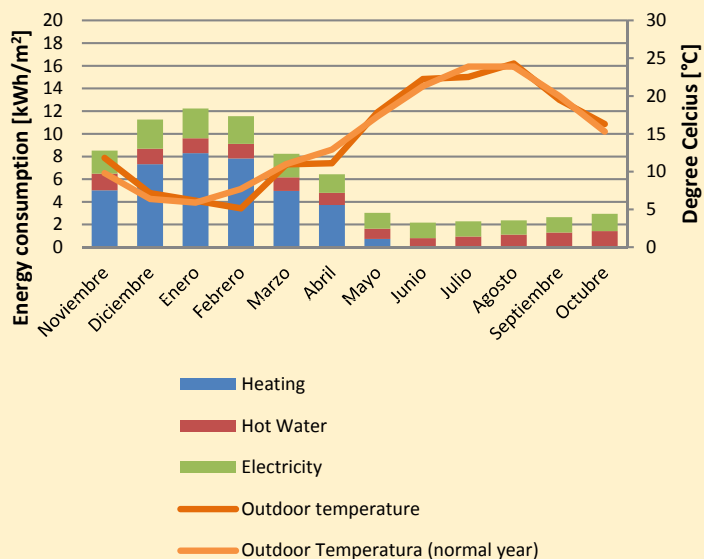
- Complete refurbishment, including the installation of elevators
- EIFS (Exterior Insulation and Finishing System) applied to the external façade (Avoidance of thermal bridges and increased insulation)
- Individual electric and thermal meters
- Optimization of window type (duplication of the frames)
- Photovoltaic Field



## Energy consumption

\* National Regulations (2006)

### Energy consumption 2011-2012



| Heat trans.     | Unit               | National reg.* | Concerto spec. | Actual |
|-----------------|--------------------|----------------|----------------|--------|
| Outerwall       | W/m <sup>2</sup> K | 0.66           | 0.66           | 0.442  |
| Roof            | W/m <sup>2</sup> K | 0.49           | 0.38           | 0.265  |
| Floor           | W/m <sup>2</sup> K | 0.49           | 0.5            | 0.25   |
| Windows (north) | W/m <sup>2</sup> K | 3              | -              | -      |
| Windows (south) | W/m <sup>2</sup> K | 3.5            | -              | -      |
| Glazing         | W/m <sup>2</sup> K | -              | 1.7            | 1.67   |
| Vent. rate      | h <sup>-1</sup>    | 1              | 0.5            | 0.5    |

| Energy consumption | Unit               | National reg.* | Concerto spec. | Actual 2011-2012 |
|--------------------|--------------------|----------------|----------------|------------------|
| Heat               | kWh/m <sup>2</sup> | 125            | 58             | 37.9             |
| Hot water          | kWh/m <sup>2</sup> | 20             | -              | 14.2             |
| Electricity        | kWh/m <sup>2</sup> | 25             | -              | 21.6             |
| Total              | kWh/m <sup>2</sup> | 170            | 58             | 73.7             |
| PV field           | MWh                | -              | -              | 9.67             |

## ECO-City project partners

## Lessons learned:

- Several difficulties have been found since an agreement between the 100% of the users was necessary. In Spain every flat has a private owner so it is necessary to achieve a high percentage of agreement to modify structural components of a building.
- To grant the success of Eco-rehab in areas where inhabitants have low incomes, it is crucial to gain the access to soft loans. The application of these loans must be done in the basis of the Community and not as a personal loan, due to the risks analysis that financial entities develop.
- The EIFS system is optimal for refurbishing since it fixes thermal bridges and does not require the users being vacated.
- Thermal comfort improvement confirmed by the users.
- Call effect (once that other users have seen the results, they want to refurbish their own buildings)
- Consumptions lower than expected, probably due to the economical context.
- Special difficulties were found to install the photovoltaic field because of the user's distrust (even though the cost for them was 0).



## Key figures

| Heat trans.     | Unit               | Normal practice | Concerto spec. | Actual |
|-----------------|--------------------|-----------------|----------------|--------|
| Outerwall       | W/m <sup>2</sup> K | 0.66            | 0.66           | 0.442  |
| Roof            | W/m <sup>2</sup> K | 0.49            | 0.38           | 0.265  |
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| Windows (south) | W/m <sup>2</sup> K | 3.5             | -              | -      |
| Glazing         | W/m <sup>2</sup> K | -               | 1.7            | 1.67   |
| Vent. rate      | h-1                | 1               | 0.5            | 0.5    |

| Energy consumption | Unit                     | Normal practice | Concerto spec. | Actual 2011-2012 |
|--------------------|--------------------------|-----------------|----------------|------------------|
| Heat               | kWh/m <sup>2</sup>       | 125             | 58             | 37.9             |
| Pipe losses        | kWh/m <sup>2</sup>       | Inc             | Inc            | Inc              |
| Ventilation        | kWh/m <sup>2</sup>       | Inc             | Inc            | Inc              |
| Hot water          | kWh/m <sup>2</sup>       | 20              | Inc            | 14.2             |
| <b>Total heat</b>  | <b>kWh/m<sup>2</sup></b> | <b>145</b>      | <b>58</b>      | <b>52.1</b>      |
| Lighting           | kWh/m <sup>2</sup>       | Inc             | -              | Inc              |
| Other              | kWh/m <sup>2</sup>       | Inc             | -              | Inc              |
| <b>Total elec.</b> | <b>kWh/m<sup>2</sup></b> | <b>25</b>       | <b>-</b>       | <b>21.6</b>      |
| <b>Total</b>       | <b>kWh/m<sup>2</sup></b> | <b>170</b>      | <b>-</b>       | <b>73.7</b>      |
| PV                 | MWh                      | -               | -              | 9.67             |

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