Multi-use: Grégoire-Opdebeeck in Brussels BE

PROJECT SUMMARY
Conversion and renovation of an old laundry to residential and office space in two phases:
- Insulation and solar collectors
- PV installation
Primary energy reduced 70%!

SPECIAL FEATURES
16 m² Solar thermal collectors
41 m² PV installation

ARCHITECT
Modelmo Office
Marc Opdebeeck

OWNERS
Mrs Grégoire and Mr Opdebeeck

IEA – SHC Task 37
Advanced Housing Renovation with Solar & Conservation
SUMMARY OF THE RENOVATION

- House on the street:
  - 440 m² residential
  - heating by radiators
- House to the rear:
  - 200 m² residence
  - 16 m² solar panel type CPC with 2200 L storage
  - Radiant floor heating in all rooms
  - wood-stove
- In common:
  - regulation-system type Consolar 601
  - natural ventilation
  - parking for 10 bicycles

BACKGROUND

Until the 1960’s the building was an old laundry behind the main house.

This structure has been converted to an architectural and a graphic office on the ground-floor facing the street with apartments above and to the rear is a very low-energy house.
**CONSTRUCTION**

**Floor construction**  *U-value: 0.49 W/(m²·K)*
- Ceramic tile 10 mm
- Screed 80 mm
- Insulation 70 mm
- Concrete 120 mm
- Total 280 mm

**Wall construction**  *U-value: 0.20 W/(m²·K)*  
(interior to exterior)
- Interior plaster 15 mm
- Celulose 200 mm
- Traditional masonry (existing) 300 mm
- Total 515 mm

**Main roof construction**  *U-value: 0.21 W/(m²·K)*  
(top down)
- Zinc roof with cleats 0.8 mm
- Mineral wool panels 240 mm
- Still air space 25 mm
- Plaster 15 mm
- Total 280 mm
Summary of U-values W/(m²·K)

<table>
<thead>
<tr>
<th></th>
<th>Before</th>
<th>After</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground floor</td>
<td>3.65</td>
<td>0.49</td>
</tr>
<tr>
<td>Walls</td>
<td>2.12</td>
<td>0.20</td>
</tr>
<tr>
<td>Roof</td>
<td>3.0</td>
<td>0.21</td>
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<tr>
<td>Windows</td>
<td>2.6</td>
<td>1.10</td>
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ENERGY PERFORMANCE

<table>
<thead>
<tr>
<th></th>
<th>kWh primary energy</th>
</tr>
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<tbody>
<tr>
<td>before renovation</td>
<td></td>
</tr>
<tr>
<td>Heating (gas)</td>
<td>180 kWh/ m²/ a x 1.1 = 198</td>
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<tr>
<td>Hot water (gas)</td>
<td>28 kWh/ m²/ a x 1.1 = 31</td>
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<tr>
<td>Electricity</td>
<td>16 kWh/ m²/year x 2.7 = 43 P</td>
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<tr>
<td>Total</td>
<td>224 kWh/ m²/ year</td>
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<tr>
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<tbody>
<tr>
<td>after renovation</td>
<td></td>
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<tr>
<td>Heating (gas)</td>
<td>52 kWh/ m²/ a x 1.1 = 57</td>
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<tr>
<td>(wood)</td>
<td>4 kWh/ m²/ a x 0.2 = 1</td>
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<tr>
<td>Heating (gas)</td>
<td>12 kWh/ m²/ a x 1.1 = 13</td>
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<tr>
<td>(wood)</td>
<td>4 kWh/ m²/ a x 0.2 = 1</td>
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<tr>
<td>Electricity (grid)</td>
<td>4 kWh/ m²/ a x 1.1 = 4</td>
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<tr>
<td>Electricity (PV)</td>
<td>8 kWh/ m²/ a x 0.7 = 6</td>
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<tr>
<td>Total</td>
<td>82 kWh/ m²/ a</td>
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</tbody>
</table>

Reduction Primary Energy*: 70 %  *PHPP 2007

INFORMATION SOURCES

Architect M. Opdebeeck
www.modelmo.be

Brochure author
M. Opdebeeck
B. Vanden Breede

BUILDING SERVICES

Phase I (2002-03):
- Insulation house to the rear
- 16m² solar thermal collectors
- 2200 l thermal storage tank

Phase II (2008):
- PV-installation
  23 m² on the roof of the main house
  18 m² in the garden
  estimation total production: +/- 5550 kWh/year

RENEWABLE ENERGY USE

16 m² solar panel
20 m³ water tank
41 m² PV installation