



Factsheet


DEMO 5 Limited liability housing company

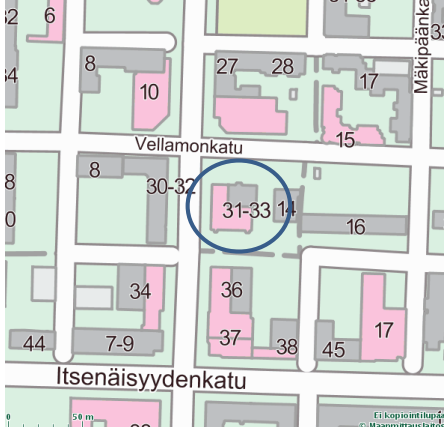
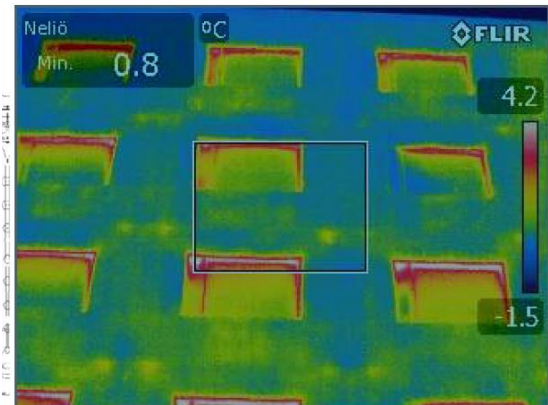
























Tammelan puistokatu 31-33



EU-GUGLE stands for “European cities serving as Green Urban Gate towards Leadership in sustainable Energy” and is funded under the 7th Framework Programme for Research and Technological Innovation. It is co-ordinated by CENER, Spain’s National Centre for Renewable Energies.


PROFILE

| | | |
|----------------------------|---|----------|
| Name and address | <i>Demonstration area Tammela district and DEMO 5 Limited liability housing company Tammelan puistokatu 31-33</i> | |
| Map |  | |
| Description | <p><i>The Tammela district, where the renovations took place, has 6.337 inhabitants. The age distribution of Tammela is mostly elderly people, young couples and students. 94 % of the inhabitants are between 18 and 85 and only 6 % between 0 and 17. Decision making in the privately owned limited liability housing companies can be challenging because of the lack of interest in doing big renovations and the lack of funds. Tammela district is also a demonstration area for infill development. Additionally, there are several projects that are trying to help and encourage the limited liability housing companies in the area to use infill development as a means of funding renovations and improving the quality of living.</i></p> | |
| Ownership | <i>Owner occupied</i> | |
| Gross surface | <i>2 488 m²</i> | |
| Number of dwellings | <i>24</i> | |
| Energy performance | BEFORE | <i>F</i> |
| | TARGET/AFTER | <i>C</i> |

| | | | | | | | | | | | | | | | | | | | | | | | |
|---|--|---|-----|--|--|--------|--|--|---------|--|--|---------|--|--|---------|---|--|---------|---|---|------|---|--|
| Detailed characteristics of building | This section should be a detailed overview of the building characteristics | | | | | | | | | | | | | | | | | | | | | | |
| Plot map |  | | | | | | | | | | | | | | | | | | | | | | |
| Building envelope | <i>Pre-fabricated concrete building walls U value 0,8; windows 2,2</i> | | | | | | | | | | | | | | | | | | | | | | |
| Technical system | <i>District heating; central heating; mechanical exhaust air Renewables in district heat production 17 % Renewables in grid electricity 13 %</i> | | | | | | | | | | | | | | | | | | | | | | |
| Thermal imaging before refurbishment |  | | | | | | | | | | | | | | | | | | | | | | |
| Energy performance certificate ¹ | <table border="1" data-bbox="555 1391 1417 1753"> <tr> <td>-75</td> <td>A </td> <td></td> </tr> <tr> <td>76-100</td> <td>B </td> <td></td> </tr> <tr> <td>101-130</td> <td>C </td> <td></td> </tr> <tr> <td>131-160</td> <td>D </td> <td></td> </tr> <tr> <td>161-190</td> <td>E </td> <td></td> </tr> <tr> <td>191-240</td> <td>F </td> <td></td> </tr> <tr> <td>241-</td> <td>G </td> <td></td> </tr> </table> | | -75 | A  | | 76-100 | B  | | 101-130 | C  | | 131-160 | D  | | 161-190 | E  | | 191-240 | F  |  | 241- | G  | |
| -75 | A  | | | | | | | | | | | | | | | | | | | | | | |
| 76-100 | B  | | | | | | | | | | | | | | | | | | | | | | |
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| 131-160 | D  | | | | | | | | | | | | | | | | | | | | | | |
| 161-190 | E  | | | | | | | | | | | | | | | | | | | | | | |
| 191-240 | F  |  | | | | | | | | | | | | | | | | | | | | | |
| 241- | G  | | | | | | | | | | | | | | | | | | | | | | |

¹Not based on the official energy certificate calculation. Calculation is based on the Finnish 2013 legislation regarding buildings' energy certificates 18.1.2013/50 and takes into account more precisely the technical values of the measures implemented in the building.

2 – Refurbishment concept

| | |
|------------------|---|
| Concept |  |
| Energy solutions | 100 % own heat production |
| Financing model | Bank loan; EU grant |

| | |
|-------------------------------|---|
| Technical system | |
| Mechanical ventilation | <i>Mechanical exhaust air ventilation; heat recovery system</i> |
| Thermal renewable integration | <i>Heat pump 90 kW Renewables in DH production 38 % Renewables in grid electricity 25 %</i> |

3 - Implementation

| Stakeholders involved | |
|-----------------------------|-------------------------|
| Project manager | Teisko LVI Oy |
| Technical system designer | Smart Heating System Oy |
| Technical system contractor | Smart Heating System Oy |
| Lighting and electricity | Kaapelipojat Oy |
| Garage doors | Metallityö Välimäki Oy |
| Supervision | Teisko LVI Oy |

| Costs and financing ² | | |
|----------------------------------|--------------------------------------|----------------|
| Refurbishment costs | <i>Heating</i> | <i>128 000</i> |
| | <i>LED lighting</i> | <i>5 300</i> |
| | <i>Door and windows</i> | <i>5 600</i> |
| | <i>VAT 24 %</i> | <i>33 000</i> |
| | <i>Total €</i> | <i>172 000</i> |
| | <i>Total €/m2</i> | <i>69</i> |
| Financial resources | <i>Bank loan 60 %; EU Grant 40 %</i> | |

| Implementation planning | |
|--|-------------|
| 1 - Step one | 2014 |
| <i>Design brief</i> | |
| 2 - Step two | 2015 |
| <i>Detailed planning, implementation and commissioning</i> | |

²Costs are based on different actual and calculated costs shifted to the comparison year 2014-2016 with the construction cost index.

Work progress

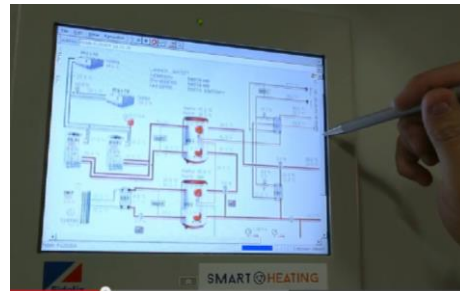
Boiler room with new equipments



























Exhaust air heat pump



Control and monitoring unit



4 - Description after refurbishment

| | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|-----|---|--|--------|---|--|---------|--|--|---------|---|--|---------|--|--|---------|--|--|------|--|--|
| Photo to show architectonic concept | <i>No measures</i> | | | | | | | | | | | | | | | | | | | | | | | |
| Envelope characteristics | <i>New garage doors</i> | | | | | | | | | | | | | | | | | | | | | | | |
| Technical system | <i>Heat recovery systems 10.1 kW and 14,4 kW Exhaust air heat pump 50 kW + 16 kW + 16 kW; COP 2-4 LED lighting with presence control</i> | | | | | | | | | | | | | | | | | | | | | | | |
| Renewable energy sources | <i>Renewables in district heat production 38 % Renewables in grid electricity 25 %</i> | | | | | | | | | | | | | | | | | | | | | | | |
| Energy consumption (final) | <i>75 kWh/m²/a</i> | | | | | | | | | | | | | | | | | | | | | | | |
| Energy efficiency certificate ³ <i>Note: Weighted by energy form factors</i> | <table border="1"> <tr> <td>-75</td> <td></td> <td></td> </tr> <tr> <td>76-100</td> <td></td> <td></td> </tr> <tr> <td>101-130</td> <td></td> <td></td> </tr> <tr> <td>131-160</td> <td></td> <td></td> </tr> <tr> <td>161-190</td> <td></td> <td></td> </tr> <tr> <td>191-240</td> <td></td> <td></td> </tr> <tr> <td>241-</td> <td></td> <td></td> </tr> </table> | | | -75 |  | | 76-100 |  | | 101-130 |  |  | 131-160 |  | | 161-190 |  | | 191-240 |  | | 241- |  | |
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5 - Performance monitoring

| | |
|---------------------------|--|
| Monitoring System | <i>Remote monitoring system. Smart metering by utility company (electricity)</i> |
| Monitored variable | <i>Heat created for space and water heating Water Electricity</i> |

| Performances⁴ | | | |
|---|-----------------|----------------|------------------|
| | Existing | Planned | Monitored |
| Electric consumption kWh/m ² /year | 8 | 8 | 8 |
| Thermal consumption kWh/m ² /year (HP electricity) | - | 23 | 22 |
| Thermal consumption kWh/m ² /year (DH) | 205 | 131 | 111 |
| Thermal consumption kWh/m ² /year (own production) | - | -56 | -67 |
| Gross energy consumption in final energy | 212 | 107 | 74 |
| Electric RES contribution kWh/m ² /year | 1 | 8 | 2 |
| Thermal RES contribution kWh/m ² /year | 35 | 106 | 109 |
| Operational costs €/m ² /year | 11 | 7 | 3 |

⁴The monitoring began in 8/2016. Comparison between the calculated original and planned status as well as monitored values for the completed building after at least one whole year of monitoring.