




Factsheet

BEST 4 Limited liability housing company Aiononkatu 2

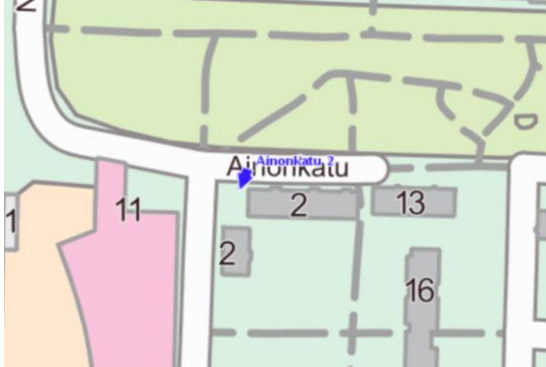

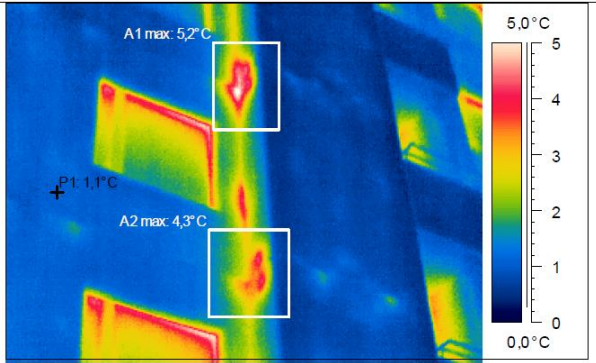


EU-GUGLE stands for “European cities serving as Green Urban Gate towards Leadership in sustainable Energy” and is funded under the 7th Framework Programme for Research and Technological Innovation. It is co-ordinated by CENER, Spain’s National Centre for Renewable Energies.

PROFILE

Name and address	<i>Demonstration area Tammela district and DEMO 4 Limited liability housing company Aionkatu 2</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 building</i>	
Gross surface	<i>5 554 m²</i>	
Number of dwellings	<i>70</i>	
Energy performance	<i>BEFORE</i>	<i>E</i>
	<i>TARGET/AFTER</i>	<i>D</i>

1 – Description before refurbishment

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 0,4; windows U value 2,5</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	-75	A	
	76-100	B	
	101-130	C	
	131-160	D	
	161-190	E	F
	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	
Financing model	<i>Bank loan; EU grant</i>

Envelope details	
Wall to fenestration section (thermal bridge)	<i>New windows and doors</i>

Technical system	
Technical system	<i>District heating; Energy efficiency improvements of central heating, ventilation and lighting Renewables in district heat production 38 %</i>
Thermal renewable integration	<i>Heat recovery and exhaust air heat pump</i>
Electric renewable integration	<i>Renewables in grid electricity 25 %</i>

3 - Implementation

Stakeholders involved	
Project manager	<i>As Oy Aionkatu 2, Chair Veli-Matti Rekola</i>
Technical system designer	<i>Insinööritoimisto Mikko Ilvesmäki Oy</i>
Main contractor	<i>Honkoliini Professional Oy</i>
Sub-contractor	<i>Putkialan Remonttipalvelu Oy</i>
Sub-contractor	<i>Remonttipalvelu V Mäkelä Oy</i>
Sub-contractor	<i>Pirkanmaan Ilmastointipuhdistus Oy</i>

Costs and financing ²		
Refurbishment costs	<i>Ventilation and heating incl. heat pump; monitoring system</i>	<i>141 000</i>
	<i>Windows and balcony glasses</i>	<i>314 000</i>
	<i>Other renovation costs</i>	<i>40 000</i>
	<i>Planning, supervision, etc.</i>	<i>24 800</i>
	<i>VAT 24 %</i>	<i>124 800</i>
	<i>Total €</i>	<i>644 600</i>
	<i>Total €/m2</i>	<i>115</i>
Financial resources	<i>Bank loan 84 %; EU grant 16 %; National grant 1 %</i>	

Planning and implementation	
1 - Step one	2012
<i>New windows; balcony glasses</i>	
2 - Step two	2014
<i>Design brief and new front doors</i>	
3 - Step three	2015-2016
<i>Detailed planning (heating, ventilation); call for bids; implementation of measures; 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

New windows, balcony glasses and pipeline from roof (heat recovery unit) and basement (heat pump unit)






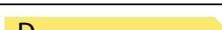




Renovated boiler room (storage tank, heat pump)



Low pressure device and control unit



4 - Description after refurbishment

Photo to show architectural concept	<i>No measures</i>		
A thermal imaging showing before/after insulation	<i>N/A</i>		
Envelope characteristics	<i>Windows U value 1</i>		
Technical system	<i>LED lighting</i>		
Renewable energy sources	<i>Exhaust air heat pump; 46 kW Renewables in district heat production 38% Renewables in grid electricity 25%</i>		
Energy consumption (final and primary)	<i>116 kWh/m²/a</i>		
Energy efficiency certificate ³	-75	A 	
	76-100	B 	
	101-130	C 	
	131-160	D 	
	161-190	E 	
	191-240	F 	
	241-	G 	

³Not 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.

5 - Performance monitoring

Monitoring System	Remote monitoring system; Smart metering by utility company
Monitored variable	District heat to space heating and DHW Heat created Water Electricity

Performances ⁴			
	Existing	Planned	Monitored
Electric consumption kWh/m ² /year	8	27	N/A
Thermal consumption kWh/m ² /year (HP electricity)	-	19	N/A
Thermal consumption kWh/m ² /year (DH)	184	111	N/A
Thermal consumption kWh/m ² /year (Own production)	-	-48	N/A
Gross energy consumption in final energy	191	90	N/A
Electric RES contribution kWh/m ² /year	1	7	N/A
Thermal RES contribution kWh/m ² /year	31	90	N/A
Operational costs €/m ² /year	10	6	N/A

⁴The first results will be available in 3/2017. 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.