




Factsheet

BEST 1 Limited liability housing company
Itsenäisyydenkatu 15

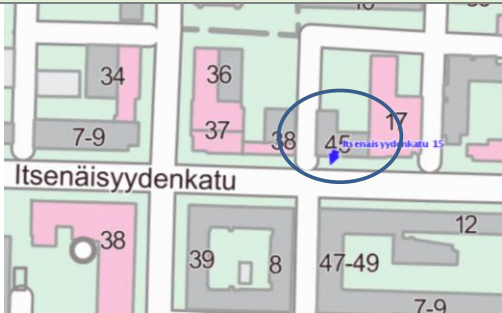
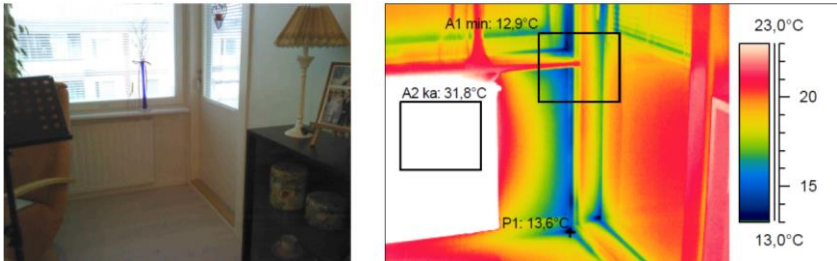


EU-GUGLE stands for “European cities serving as Green Urban Gate towards Leadership in sustainable Energy” and is funded under the 7th Framework Programme for Research and Technological Innovation.
It is co-ordinated by CENER, Spain’s National Centre for Renewable Energies.

PROFILE



Name and address	<i>Demonstration area Tammela district and DEMO 1 Limited liability housing company Itsenäisyydenkatu 15</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>1 960 m²</i>	
Number of dwellings	<i>20 dwellings, 4 store spaces</i>	
Energy performance	<i>BEFORE</i>	<i>G</i>
	<i>TARGET/AFTER</i>	<i>E</i>

1 – Description before refurbishment

Detailed characteristics of building	This section should be a detailed overview of the building characteristics		
Plot map			
Building envelope	Glass facade U value 0,8; windows U value 2,5		
Technical system	District heating; central heating; mechanical exhaust air Renewables in district heat production 17 % Renewables in grid electricity 13 %		
Thermal imaging before refurbishment			
Energy performance certificate ¹	-75	A	
	76-100	B	
	101-130	C	
	131-160	D	
	161-190	E	
	191-240	F	
	241-	G	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>National subsidy, EU Grant, Bank loan</i>

Envelope details	
Roof to wall insertion section (thermal bridge)	<i>New roof</i>
Ground to wall section (thermal bridge)	<i>Additional insulation and new facade</i>
Wall to fenestration section (thermal bridge)	<i>New windows</i>

Technical system	
Mechanical ventilation	<i>Mechanical exhaust air ventilation</i>
Thermal renewable integration	<i>Exhaust-air heat-recovery and heat pump</i>
Electric renewable integration	N/A

3 - Implementation

Stakeholders involved	
Project manager	Lara Oy
Design (structures)	Huura Oy
Design (building service system)	Tervo Group OyOy
Windows	Skaala Oy
Installer HVAC	Vesinieminen Oy
Installer electricity	WSK sähkö Oy
Remote monitoring system	Enermix Oy

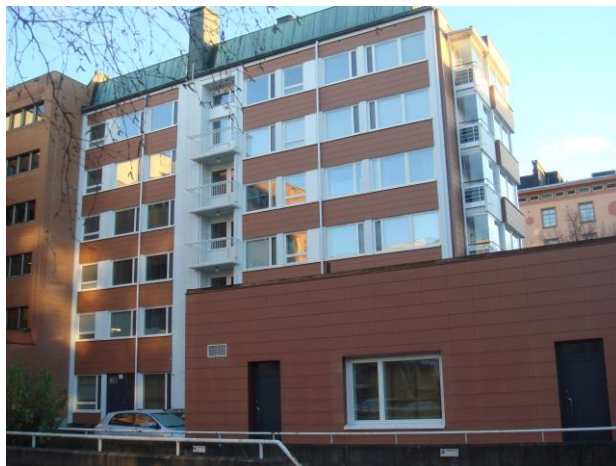
Costs and financing ²			
Refurbishment costs (€)	Facades, windows, doors	297 000	
	Heating and ventilation	67 800	
	Lighting; electricity	52 100	
	Other measures	14 300	
	Planning, supervision, etc.	32 300	
	VAT (24 %)	111 240	
	Total (€)	575 000	290 € / m ²
Financial resources	Applied EU grant	24 000	12 %
	National subsidy	67 000	4 %
	Bank loan	484 000	84 %

Planning and implementation	
1 - Step one	2009
Condition assessment	
2 - Step two	2011-2013
Design brief, detailed planning and implementation (facades and windows)	
3 - Step three	2014-2015
Design brief, detailed planning and implementation (building service systems; roof)	

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

Work progress

New façade and windows




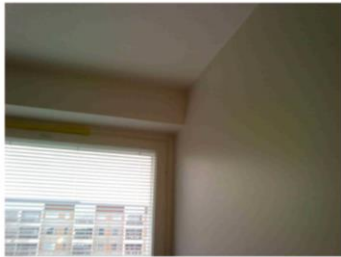
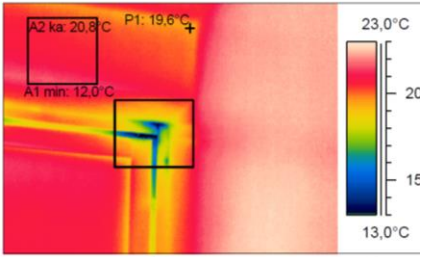
Roof and ventilation renovation



Heat exchanger



4 - Description after refurbishment

Photo to show architectonic concept	
A thermal imaging showing before insulation	 
Envelope characteristics	<i>Facades U value 0,2 (additional insulation 200 mm)</i> <i>Windows U value 1</i>
Technical system	<i>District heating; central heating; LED lighting with presence control</i>
Renewable energy sources	<i>Heat recovery and exhaust air heat pump, 17 kW</i> <i>Renewables in district heat production 38 %</i> <i>Renewables in grid electricity 25 %</i>
Energy consumption (final)	<i>154 kWh/m²/a</i>

Energy efficiency certificate³ <i>Note: weighted by energy form factor</i>	-75	A	
	76-100	B	
	101-130	C	
	131-160	D	
	161-190	E	E
	191-240	F	
	241-	G	

5 - Performance monitoring

Monitoring system	<i>Remote monitoring system Talotohtori ® and smart metering by utility company</i>
Monitored variables	<i>District heat to space and DWH heating Heat created Water Electricity</i>

Performances⁴			
	Existing	Planned	Monitored
Electric consumption kWh/m2/year	15	37	N/A
Thermal consumption kWh/m2/year (HP electricity)	-	22	N/A
Thermal consumption kWh/m2/year (DH)	276	145	N/A
Thermal consumption kWh/m2/year (Own production)	-	-62	N/A
Gross energy consumption in final energy	291	120	N/A
Electric RES contribution kWh/m2/year	2	9	N/A
Thermal RES contribution kWh/m2/year	47	117	N/A
Operational costs €/m2/year	16	8	N/A

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⁴The monitoring began in 12/2016. 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.