




Fact sheet

BEST 2 Limited liability housing company Kaupinpirtti



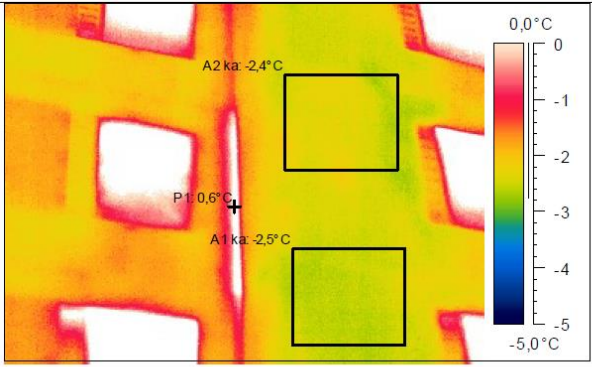


EU-GUGLE stands for “European cities serving as Green Urban Gate towards Leadership in sustainable Energy” and is funded under the 7th Framework Programme for Research and Technological Innovation. It is co-ordinated by CENER, Spain’s National Centre for Renewable Energies.

PROFILE

Name and address	<i>Demonstration area Tammela district and DEMO 2 Limited liability housing company Kaupinpiirtti</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 ages 18 and over 85 and only 6 % between the ages 0 and 17. Decision making in the privately owned limited liability housing companies can be challenging because of the lack of interest to 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	3 693 m ²	
Number of dwellings	78	
Energy performance	<i>BEFORE</i>	<i>F</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	Pre-fabricated concrete U value 0,4; windows U value 2,5
Technical system	District heating; central heating; mechanical exhaust air ventilation <i>Renewables in district heat production 17 %</i> <i>Renewables in grid electricity 13 %</i>
Thermal imaging before refurbishment	
 K 17	 K 18

Energy performance certificate ¹	-75	A	
	76-100	B	
	101-130	C	
	131-160	D	
	161-190	E	
	191-240	F	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	Bank loan; EU Grant

Envelope details	
Ground to wall section (thermal bridge)	Additional insulation; new outer skin
Wall to fenestration section (thermal bridge)	new supply air windows $U=0,8 \text{ W/m}^2\text{K}$

Technical system	
Technical system	District heating; central heating; Remote monitoring; Energy efficient LED lighting with presence control Renewables in district heat production 38 % Renewables in grid electricity 25 %
Thermal renewable integration	Heat recovery by exhaust air heat pump
Electric renewable integration	N/A

3 - Implementation



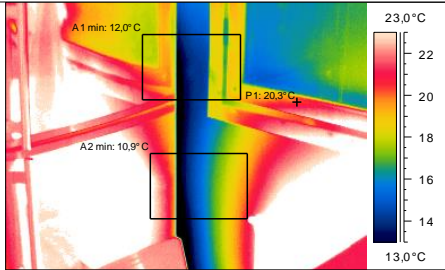
Stakeholders involved	
Planning	A Insinöörit Suunnittelu Oy
Envelope designer	A Insinöörit Suunnittelu Oy
Main contractor	IS-Yhtiö Oy
Windows supplier	Pihla Oy
Sub contractors	Putkityö KV Oy

Costs and financing ²	
Refurbishment costs	<i>Breakdown of all costs (work, monitoring, etc) - N/A the whole budget around 1,6 MEUR</i>
Financial resources	<i>Bank loan 90 % EU GUGLE GRANT 10%</i>

Planning and Implementation	
1 - Step one	2014
<i>Condition assessment; thermographs; design brief</i>	
2 - Step two	2015
<i>Detailed planning</i>	
3 - Step three	2016
<i>Call for bids; procurement; implementation of deep renovation</i>	

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

4 - Description after refurbishment

Photo to show architectonic concept	
A thermal imaging showing before insulation	 
Envelope characteristics	<i>Additional insulation; new skin; new supply air windows U value 0,8 W/m²K; façade U=0,21 W/m²K</i>
Technical system	<i>District heating; central heating; LED lighting with presence control</i>
Renewable energy sources	<i>Exhaust air heat pump 40kW Renewables in district heat production 38 % Renewables in grid electricity 25 %</i>
Energy consumption (final)	<i>119 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	D
	161-190	E	
	191-240	F	
	241-	G	

5 - Performance monitoring

Monitoring System	<i>Remote monitoring system. Smart metering by utility company</i>
Monitored variable	<i>District heat to space heating and DHW Heat created Water Electricity</i>

Performances⁴			
	Existing	Planned	Monitored
Electric consumption kWh/m ² /year	7	27	N/A
Thermal consumption kWh/m ² /year (HP electricity)	-	20	N/A
Thermal consumption kWh/m ² /year (DH)	186	114	N/A
Thermal consumption kWh/m ² /year (Own production)	-	-49	N/A
Gross energy consumption in final energy	193	92	N/A
Electric RES contribution kWh/m ² /year	1	7	N/A
Thermal RES contribution kWh/m ² /year	32	92	N/A
Operational costs €/m ² /year	10	6	N/A

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.

⁴The first monitored year will be 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.