

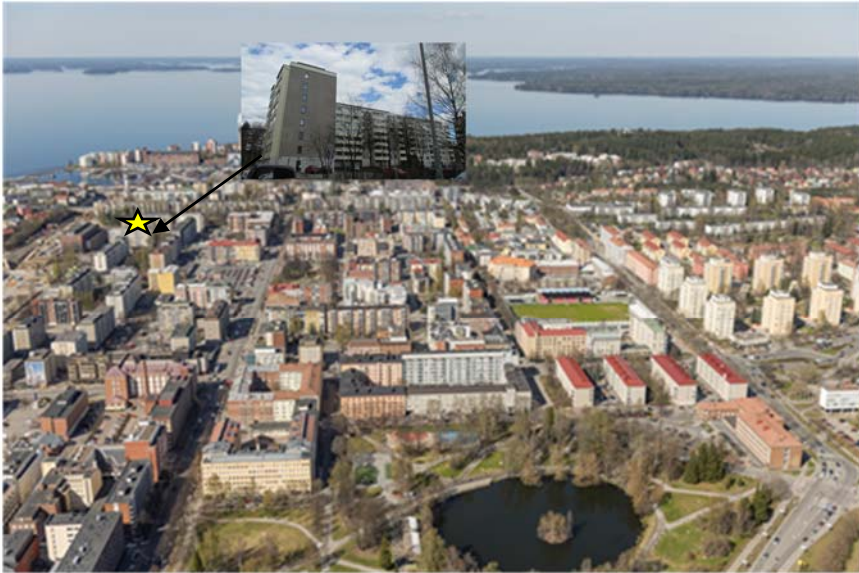
# Factsheet

BEST 4 Ltd housing company Aiononkatu 2

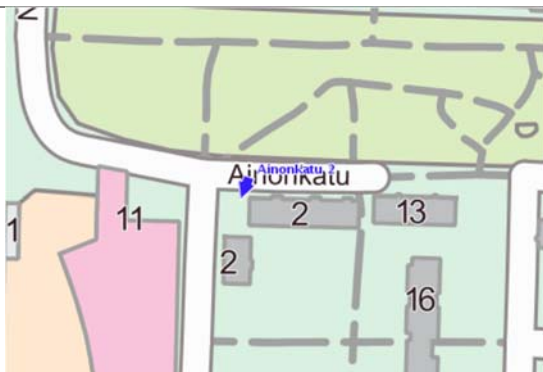
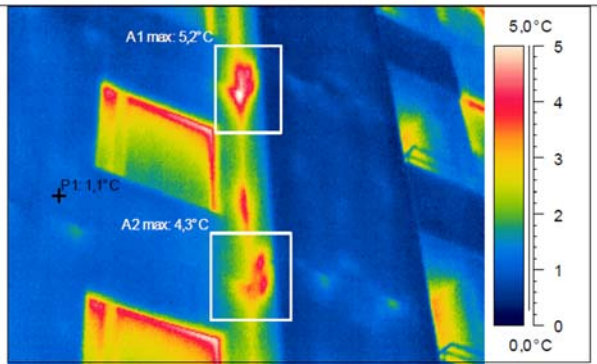



EU-GUGLE stands for “European cities serving as Green Urban Gate towards Leadership in sustainable Energy” and is funded under the 7<sup>th</sup> Framework Programme for Research and Technological Innovation.  
It is co-ordinated by CENER, Spain’s National Centre for Renewable Energies.

## 1 - PROFILE

Name and address	<i>The demonstration area Tammela district and BEST 4 Ltd housing company Ainonkatu 2</i>	
Map	 <p>Copyright 2016 Lentokuva Vallas Oy</p>	
Description	<p><i>Tammela district, where the renovations take place, has around 7000 inhabitants. The age distribution of Tammela is one-sidedly mostly elderly people, young couples and students. 94 % of the inhabitants are between 18-over 85 years and only 6 % between the ages 0-17. Decision making in the privately owned limited liability housing companies can be challenging because of lack of interest to do big renovations and lack of funds. Tammela district is also demonstration area for infill development. And 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 improve quality of living.</i></p>	
Ownership	<i>Owner occupied building</i>	
Gross volume	<i>5554 m<sup>2</sup></i>	
Number of dwellings	<i>70</i>	
Energy performance	<i>BEFORE</i>	<i>E</i>
	<i>TARGET/AFTER</i>	<i>C</i>

## 2 - Before refurbishment

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			
<div></div>			
Energy performance certificate*  <i>Note: weighted by energy form factor 2012</i>  <i>Includes standard use by households (cooking, white line, entertainment electronics, etc.)</i>	-75	<div><div>A</div></div>	
	76-100	<div><div>B</div></div>	
	101-130	<div><div>C</div></div>	
	131-160	<div><div>D</div></div>	
	161-190	<div><div>E</div></div>	<div><div>E</div></div>
	191-240	<div><div>F</div></div>	
	241-	<div><div>G</div></div>	

\*Not the official energy certificate calculation.

### 3 - Implementation









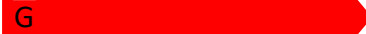







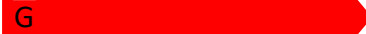







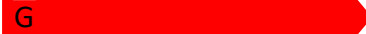
Stakeholders involved	
Project manager	<i>As Oy Aionkatu 2, Chair Veli-Matti Rekola</i>
Technical system designer	<i>Insinööritoimisto Mikko Ilvesmäki Oy</i>
Main contractor	<i>Honkoliini Professional Oy; Helmilämpö Oy</i>
Sub-contractor	<i>Putkialan Remonttipalvelu Oy</i>
Sub-contractor	<i>Remonttipalvelu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

Costs and financing		
Refurbishment costs	<i>Ventilation and heating incl. heatpumps; monitoring system</i>	<i>340 800</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>172 700</i>
	<i>Total €</i>	<i>892 300</i>
	<i>Total €/m2</i>	<i>160</i>
Financial resources	<i>Bank loan 75 %; EU grant 24 %; National grant 1 %</i>	

Planning and implementation	
<b>1 - step one</b>	<b>2012</b>
<i>New windows; balcony glasses</i>	
<b>2 - step two</b>	<b>2014</b>
<i>Design brief and new front doors</i>	
<b>3 - step three</b>	<b>2015-2016</b>
<i>Detailed planning (heating, ventilation); call for bids; implementation of measures; commissioning</i>	
<b>4 - step four</b>	<b>2017</b>
<i>Disconnection from DH network; GSHP installation</i>	



## 4 - After refurbishment

																							
Envelope characteristics	<i>New windows U value 1</i>																						
Technical system	<i>GSHPs; Mechanical exhaust air with heat recovery and air-to-water HPs; LED lighting</i>																						
Renewable energy sources	<i>Renewable heat 100 % Renewable electricity 100 % from grid</i>																						
Energy consumption (final)	<i>61 kWh/m<sup>2</sup>/a</i>																						
Energy efficiency certificate*	<table border="1"> <tbody> <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> </tbody> </table> <p><i>Note: weighted by energy form factor 2012</i></p> <p><i>Includes use by households (cooking, white line, entertainment electronics, etc.)</i></p>		-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</i>
Monitored variables	<i>Electricity for building service systems Electricity for heating (GSHP) District heating</i>

	Unit	Before	After
Electricity for building service systems	kWh/m <sup>2</sup> /year	10	19
Electricity for GSHP	kWh/m <sup>2</sup> /year	-	42
DH from network	kWh/m <sup>2</sup> /year	162	-
Purchased energy	kWh/m <sup>2</sup> /year	172	61
Operational costs	€/ m <sup>2</sup> /year	14	5