



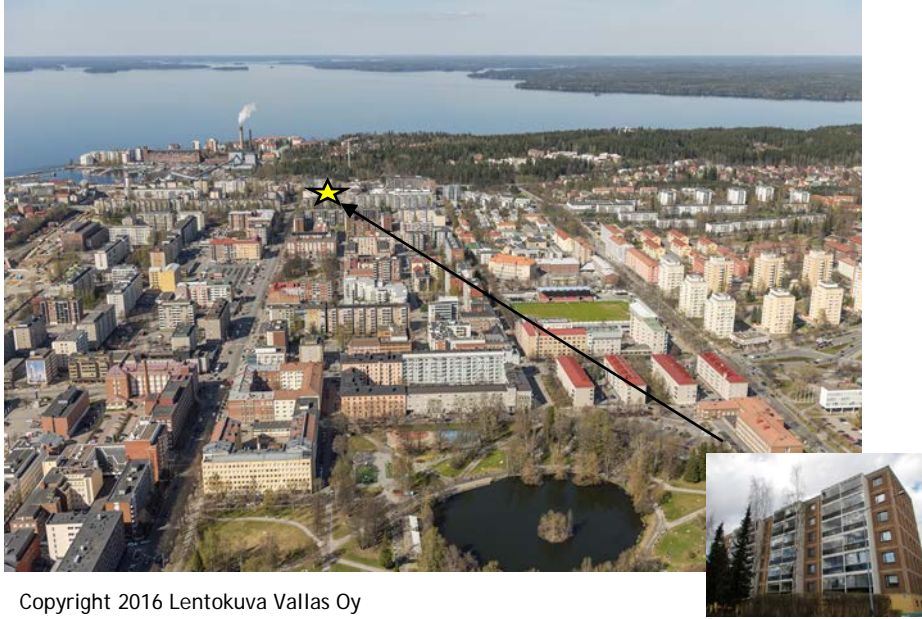
## Factsheet

BEST 7 Limited liability housing company  
Tampereen Pohjolankatu 18-20

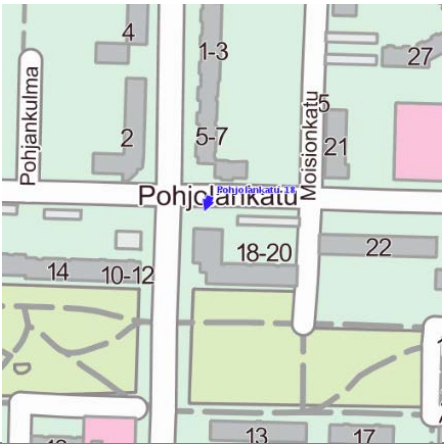


EU-GUGLE stands for “European cities serving as Green Urban Gate towards Leadership in sustainable Energy” and is funded under the 7<sup>th</sup> Framework Programme for Research and Technological Innovation.  
It is co-ordinated by CENER, Spain’s National Centre for Renewable Energies.

## PROFILE


<b>Name and address</b>	<i>The demonstration area Tammela district and DEMO 7 Limited liability housing company Tampereen Pohjolankatu 18-20</i>	
<b>Map</b>	 <p>Copyright 2016 Lentokuva Vallas Oy</p>	
<b>Description</b>	<p><i>Tammela district, where the renovations take place, has around 7000 inhabitants. The age distribution of Tammela is one-sidedly mostly elderly people. 94 % of the inhabitants are between ages 18-over 85 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>	
<b>Ownership</b>	<i>Owner occupied building</i>	
<b>Gross volume</b>	4117 m <sup>2</sup>	
<b>Number of dwellings</b>	54	
<b>Energy performance</b>	<i>BEFORE</i>	<i>E</i>
	<i>TARGET/AFTER</i>	<i>D</i>

## 1 – Description before refurbishment

Detailed characteristics of building																						
Plot map																						
Building envelope	Concrete panel building walls U value 0,35; Windows U value 2,1																					
Technical system	District heating; central heating; mechanical exhaust air Renewables in district heat production 17 % Renewables in grid electricity 13 %																					
Thermal imaging before refurbishment	Not available																					
Energy performance certificate*	<table border="1"> <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>E</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	E	191-240	F		241-	G	
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Other relevant technical aspects																						

\*Not the official energy certificate calculation. Calculation is based on the Finnish 2013 legislation of the buildings' energy certificate 18.1.2013/50 but it takes into account more precisely the technical values of the measures done in the building.

## 2 – Refurbishment concept

Concept	
Envelope	<i>New supply air windows and doors.</i>
Technical service system	<i>District heating; energy efficiency improvements of central heating, heat recovery, lighting and water service system</i>
Thermal renewable integration	<i>Exhaust air heat pump Solar collectors (10 m<sup>2</sup>) Renewables in district heat production 38 % Renewables in grid electricity 25 %</i>
Electric renewable integration	<i>No</i>
Financing model	<i>Bank loan, national subsidy, EU grant</i>



### 3 - Implementation

Stakeholders involved	
Project manager	<i>Ltd Tampereen Pohjolankatu 18-20 / Chairman of the Board</i>
Technical system designer	<i>Enermix Oy</i>
Main contractor	<i>Enermix Oy</i>
Sub contractor	<i>LVI-urakointi Kuokkanen</i>
Windows supplier	
Window and door supplier, partly	<i>Metallityö Välimäki Oy</i>
Door supplier, carage	<i>Turner Oy</i>

Costs and financing**			
Refurbishment costs	<i>Windows and doors</i>		<i>225 500</i>
	<i>Heating and ventilation</i>		<i>116 100</i>
	<i>LED lighting and electricity improvements</i>		<i>13 700</i>
	<i>Planning, supervision, etc.</i>		<i>10 000</i>
	<i>VAT 24 %</i>		<i>87 700</i>
	<i>Total €</i>		<i>453 000</i>
	<i>€ / m2</i>		<i>110</i>
Financial resources	<i>National subsidy</i>	<i>28 000</i>	<i>6 %</i>
	<i>EU grant</i>	<i>86 700</i>	<i>19 %</i>
	<i>Bank loan</i>	<i>338 300</i>	<i>75 %</i>

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

Implementation planning	
<b>1 - step one</b>	
<i>Decision of the General Meeting to start planning. The planning included several site visits to recently renovated buildings.</i>	<i>December 2013</i>
<b>2 - step two</b>	
<i>Decision of the General Meeting to accept planned measures and to start preparing procurement</i>	<i>February 2014</i>

## Work progress

New windows  
- supply air add-on  
installation



New doors under  
construction




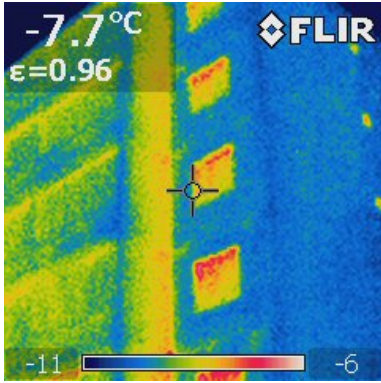
Exhaust air heatpumps and  
solar collectors on their way  
to roof



The heating and ventilation  
control unit



## 4 - Description after refurbishment

<p>New windows; balcony glasses</p>	
<p>A thermal imaging showing before/after insulation</p>	
<p>Envelope characteristics</p>	<p><i>New windows and doors (U value 1)</i></p>
<p>Technical system</p>	<p><i>District heating; central heating; LED lighting with presence control; water saving faucets</i></p>
<p>Renewable energy sources</p>	<p><i>Exhaust air heat pumps 60 kW Solar collectors 10 m<sup>2</sup> Renewables in district heat production 38% Renewables in grid energy 25%</i></p>
<p>Energy consumption</p>	<p><i>114 kWh/m<sup>2</sup>/a</i></p>

Energy efficiency certificate* <i>Note: weighted by energy form factors</i>	-75	A	
	76-100	B	
	101-130	C	
	131-160	D	D
	161-190	E	
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## 5 - Performance monitoring

Monitoring System	<i>Remote monitoring system Talotohtori<sup>®</sup>. Smart metering by utility company (district heat and electricity)</i>
Monitored variable	<i>District heat to space and water heating Harvested heat to space and water heating Water Electricity</i>

Performances ***			
	Existing	Planned	Monitored year 2015
Electric consumption kWh/m <sup>2</sup> /year	8	8	7
Thermal consumption kWh/m <sup>2</sup> /year (HP electricity)		17	15
Thermal consumption kWh/m <sup>2</sup> /year (DH)	165	109	92
Thermal consumption kWh/m <sup>2</sup> /year (own production)		-31	-57
Gross energy consumption in final energy	172	103	57
Electric RES contribution kWh/m <sup>2</sup> /year	1	2	2
Thermal RES contribution kWh/m <sup>2</sup> /year	28	73	92
Operational costs €/m <sup>2</sup> /year	9	5	3

\*\*\*Comparison between the calculated original state and the planned as well as monitored values of the completed building after at least one whole year of monitoring.