



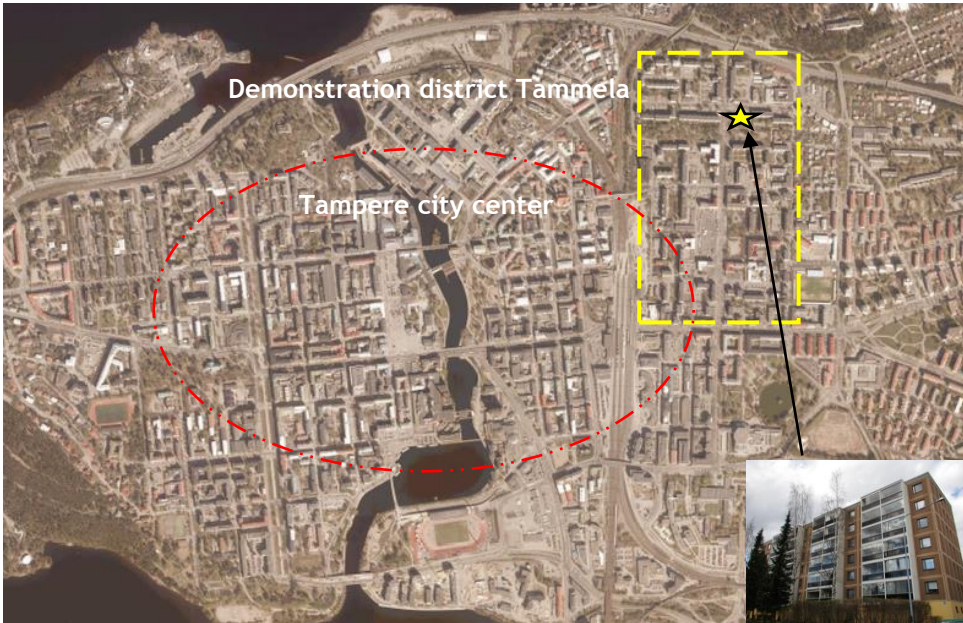
## Factsheet

BEST 7 Limited liability housing company  
Tampereen Pohjolankatu 18-20

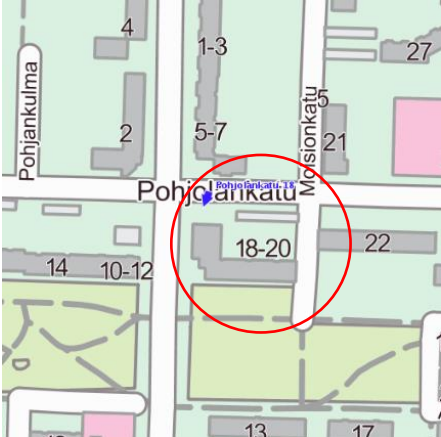


EU-GUGLE stands for “European cities serving as Green Urban Gate towards Leadership in sustainable Energy” and is funded under the 7<sup>th</sup> Framework Programme for Research and Technological Innovation. It is co-ordinated by CENER, Spain’s National Centre for Renewable Energies.

## PROFILE

Name and address	Demonstration area Tammela district and DEMO 7 Limited liability housing company Tampereen Pohjolankatu 18-20	
Map		
Description	<p>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.</p>	
Ownership	Owner occupied building	
Gross surface	4 117 m <sup>2</sup>	
Number of dwellings	54	
Energy performance	BEFORE	E
	TARGET/AFTER	D

## 1 – Description before refurbishment

Detailed characteristics of building	This section should be a detailed overview of the building characteristics		
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 <sup>1</sup>	-75	A	
	76-100	B	
	101-130	C	
	131-160	D	
	161-190	E	E
	191-240	F	
	241-	G	

<sup>1</sup>Not 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, national subsidy, EU grant</i>

### Envelope details

Wall to fenestration section (thermal bridge)	<i>New supply air windows and doors.</i>
---	--

### Technical system

Technical system	District heating; energy efficiency improvements of central heating, heat recovery, lighting and water service system
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	N/A

### 3 - Implementation

#### Stakeholders involved

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

#### Costs and financing<sup>2</sup>

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

#### 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>

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

## Work progress

New windows  
- supply air add-on  
installation



New doors under  
construction




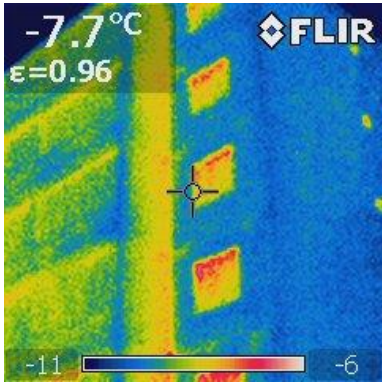
Exhaust air heatpumps and  
solar collectors on their way  
to roof



The heating and ventilation  
control unit



## 4 - Description after refurbishment

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

<b>Energy efficiency certificate<sup>3</sup></b>  <i>Note: weighted by energy form factors</i>	-75	A	
	76-100	B	
	101-130	C	
	131-160	D	D
	161-190	E	
	191-240	F	
	241-	G	

## 5 - Performance monitoring

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

<b>Performances<sup>4</sup></b>			
	<b>Existing</b>	<b>Planned</b>	<b>Monitored year 2015</b>
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

<sup>3</sup>Not 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.

<sup>4</sup>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.