

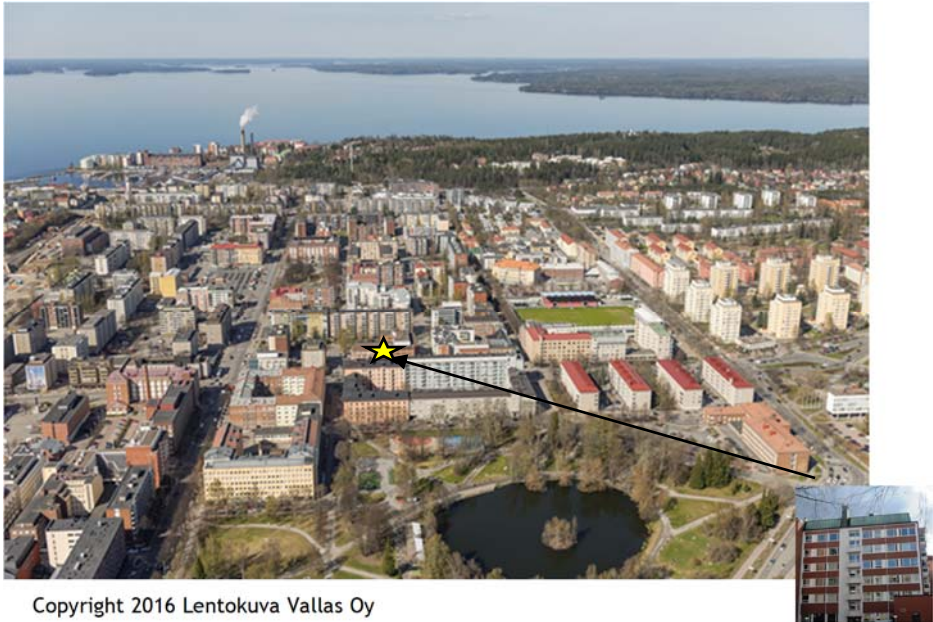
Factsheet

BEST 1 Ltd housing company Itsenäisyydenkatu 15

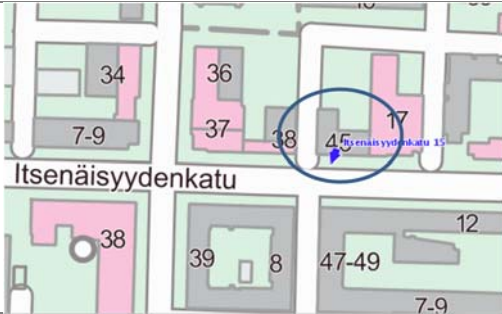
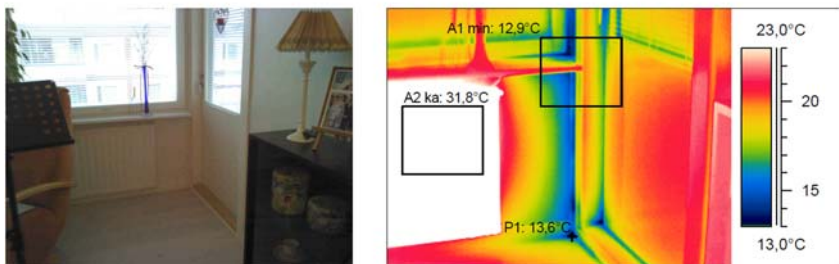


EU-GUGLE stands for “European cities serving as Green Urban Gate towards Leadership in sustainable Energy” and is funded under the 7th Framework Programme for Research and Technological Innovation.
It is co-ordinated by CENER, Spain’s National Centre for Renewable Energies.


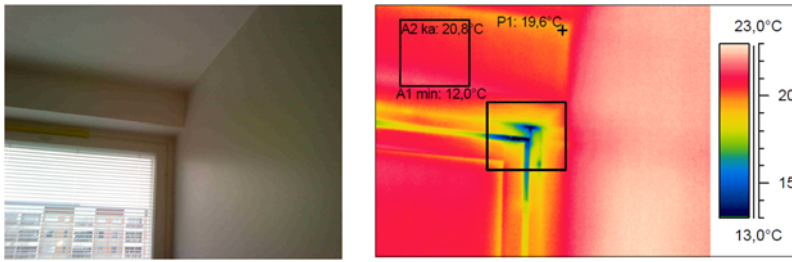
1-PROFILE

Name and address	<i>The demonstration are Tammela district and BEST 1 Ltd housing company Itsenäisyydenkatu 15</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, students and young couples. 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>	
Ownership	<i>Owner occupied building</i>	
Gross volume	<i>1960</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>

2-Before refurbishment

Detailed characteristics of building			
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* <i>Note: weighted by energy form factor 2012</i> <i>Includes standard use by households (cooking, white line, entertainment electronics, etc.)</i>	-75	A	
	76-100	B	
	101-130	C	
	131-160	D	
	161-190	E	
	191-240	F	
	241-	G	G
Other relevant technical aspects			

* Not the official energy certificate calculation.

Envelope	<p><i>Light insulation and damages</i></p> 
A thermal imaging showing before insulation	
Technical service systems	<i>Central heating; mechanical exhaust air</i>
Thermal renewable integration	<i>Renewables in DH 17 %</i>
Electric renewable integration	<i>Renewables in grid electricity 13 %</i>


3-Implementation

Stakeholders involved	
Project manager	<i>Lara Oy</i>
Design (structures)	<i>Huura Oy</i>
Design (building service system)	<i>Tervo Group OyOy</i>
Windows	<i>Skaala Oy</i>
Installer HVAC	<i>Vesinieminen Oy; Smart Heating Oy</i>
Installer electricity	<i>WSK sähkö Oy</i>
Remote monitoring system	<i>Smart Heating Oy</i>










Costs and financing**			
Refurbishment costs (€)	<i>Facades, windows, doors</i>	234 000	
	<i>Heating and ventilation</i>	223 500	
	<i>Lighting; electricity</i>	10 700	
	<i>Other measures</i>	83 400	
	<i>Planning, supervision, etc.</i>	21 000	
	<i>VAT (24 %)</i>	137 400	
	<i>Total (€)</i>	710 000	360 € / m ²
Financial resources	<i>Applied EU grant</i>	133 000	19 %
	<i>National subsidy</i>	37 000	5 %
	<i>Bank loan</i>	540 000	76 %

** Combination of actual and calculated costs.

1 - step one	2009
<i>Condition assessment</i>	
2 - step two	2011-2013
<i>Design brief, detailed planning and implementation (facades and windows)</i>	
3 - step three	2014-2015
<i>Design brief, detailed planning and implementation (building service systems; roof)</i>	
3 - step three	2017
<i>Disconnction from DH, GSHP and electricity as backup heating</i>	

Roof and ventilation renovation	
---------------------------------	--

4 - After refurbishment

Architectonic concept			
Envelope characteristics	<i>Facades U value 0,2 (additional insulation 200 mm)</i> <i>Windows U value 1</i>		
Technical system	<i>GSHP; Central heating; Mechanical exhaust air with heat recovery; LED lighting with presence control; BACs</i>		
Renewable energy sources	<i>Renewables in main heating system (GSHP) 100 %</i> <i>Renewables in grid electricity circa 100 %</i>		
Energy consumption (final)	72 kWh/m ² /a		
Energy efficiency certificate* <i>Note: weighted by energy form factor 2012</i> <i>Includes standard use by households (cooking, white line, entertainment electronics, etc.)</i>	-75		
	76-100		
	101-130		
	131-160		
	161-190		
	191-240		
	241-		

*Not the official energy certificate calculation.

5 - Performance monitoring

Monitoring system	<i>Remote monitoring system by Smart heating</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 ² /year	15	26
Electricity for GSHP	kWh/m ² /year	-	46
DH from network	kWh/m ² /year	276	-
Purchased energy	kWh/m ² /year	291	72
Operational costs	€/ m ² /year	24	6