



Factsheet

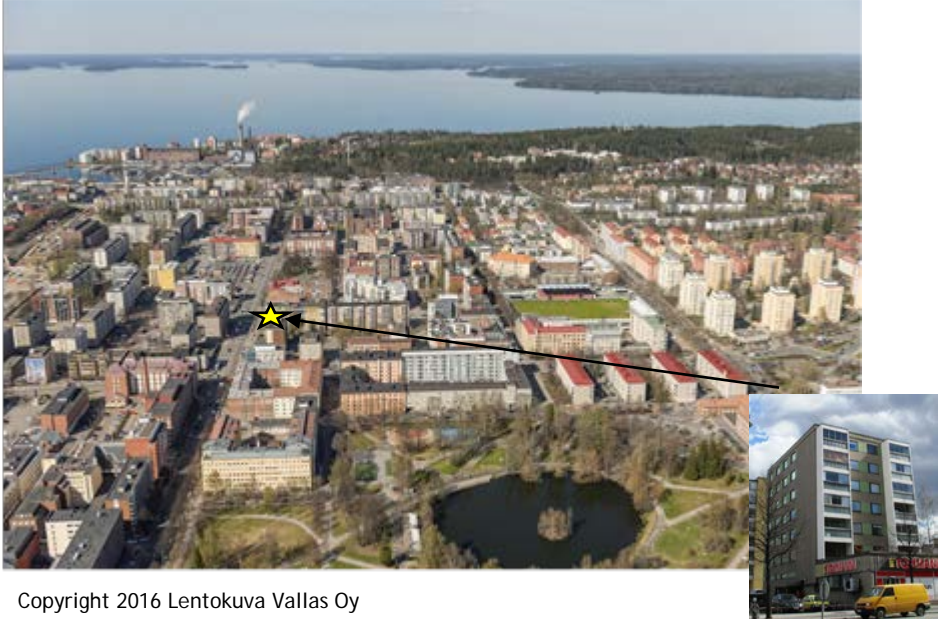
DEMO 5 Limited liability housing company

Tammelan puistokatu 31-33

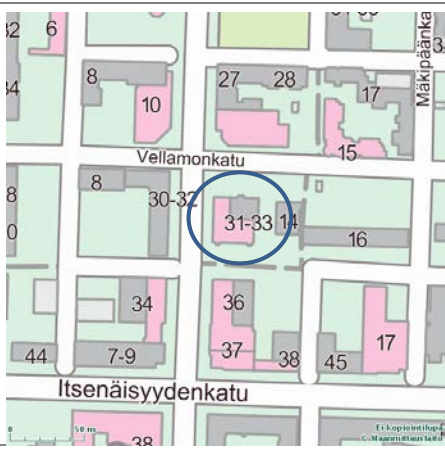
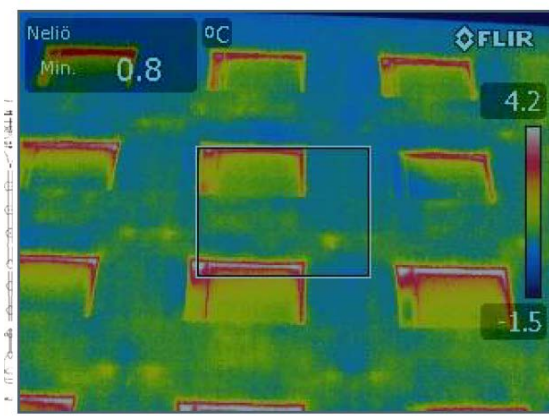


























EU-GUGLE stands for “European cities serving as Green Urban Gate towards Leadership in sustainable Energy” and is funded under the 7th Framework Programme for Research and Technological Innovation. It is co-ordinated by CENER, Spain’s National Centre for Renewable Energies.

PROFILE

Name and address	<i>The demonstration area Tammela district and DEMO 5 Limited liability housing company Tammelan puistokatu 31-33</i>	
Map	 <p data-bbox="451 1153 798 1182">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 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</i>	
Gross volume	<i>2488 m²</i>	
Number of dwellings	<i>24</i>	
Energy performance	BEFORE	<i>F</i>
	TARGET/AFTER	<i>C</i>

1 – Description before refurbishment

Detailed characteristics of building																						
Plot map																						
Building envelope	<i>Pre-fabricated concrete building walls U value 0,8; windows 2,2</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																						
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></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 		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.

<p>Concept</p>	
<p>Energy solutions</p>	<p><i>100 % own heat production</i></p>
<p>Mechanical ventilation</p>	<p><i>Mechanical exhaust; heat recovery</i></p>
<p>Thermal renewable integration</p>	<p><i>Heat pump 90 kW Renewables in DH production 38 % Renewables in grid electricity 25 %</i></p>
<p>Electric renewable integration</p>	<p>-</p>
<p>Financing model</p>	<p><i>Bank loan; EU grant</i></p>

3 - Implementation

Stakeholders involved	
Project manager	Teisko LVI Oy
Technical system designer	Smart Heating System Oy
Technical system contractor	Smart Heating System Oy
Lighting and electricity	Kaapelipojat Oy
Garage doors	Metallityö Välimäki Oy
Supervision	Teisko LVI Oy

Costs and financing**		
Refurbishment costs	<i>Heating</i>	128 000
	<i>LED lighting</i>	5 300
	<i>Door and windows</i>	5 600
	<i>VAT 24 %</i>	33 000
	<i>Total €</i>	172 000
	<i>Total €/m2</i>	69
Financial resources	<i>Bank loan 60 %; EU Grant 40 %</i>	

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

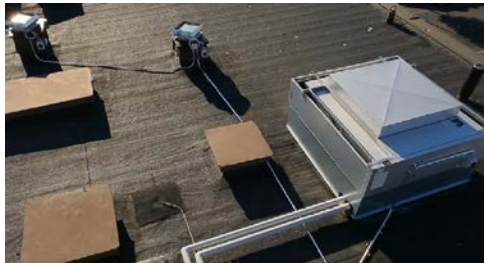
Implementation planning	
1 - step one	2014
<i>Design brief</i>	
2 - step two	2015
<i>Detailed planning, implementation and commissioning</i>	

Work progress

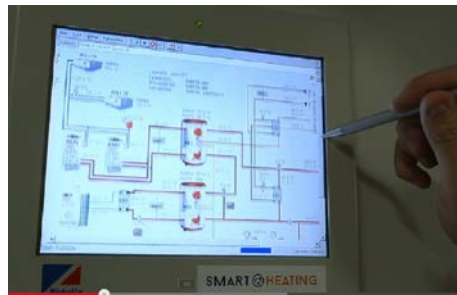
Boiler room with new equipments



























Exhaust air heat pump



Control and monitoring unit



4 - Description after refurbishment

Photo to show architectural concept	<i>No measures</i>																							
Envelope characteristics	<i>New garage doors</i>																							
Technical system	<i>Heat recovery systems 10.1 kW and 14,4 kW</i>																							
Renewable energy sources	<i>Exhaust air heat pump 50 kW + 16 kW + 16 kW; COP 2-4</i>																							
	<i>LED lighting with presence control</i>																							
	<i>Renewables in DH production 38 %</i>																							
	<i>Renewables in grid electricity 25 %</i>																							
Energy consumption (final)	<i>75 kWh/m²/a</i>																							
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<i>Note: Weightened by energy form factors</i>																								

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5 - Performance monitoring

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

Performances ***			
	Existing	Planned	Monitored
Electric consumption kWh/m ² /year	8	8	8
Thermal consumption kWh/m ² /year (HP electricity)	-	23	22
Thermal consumption kWh/m ² /year (DH)	205	131	111
Thermal consumption kWh/m ² /year (own production)	-	-56	-67
Gross energy consumption in final energy	212	107	74
Electric RES contribution kWh/m ² /year	1	8	2
Thermal RES contribution kWh/m ² /year	35	106	109
Operational costs €/m ² /year	11	7	3

***The first monitored year 8/2016. 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.