EU-GUGLE

Presentations from EU-GUGLE cities

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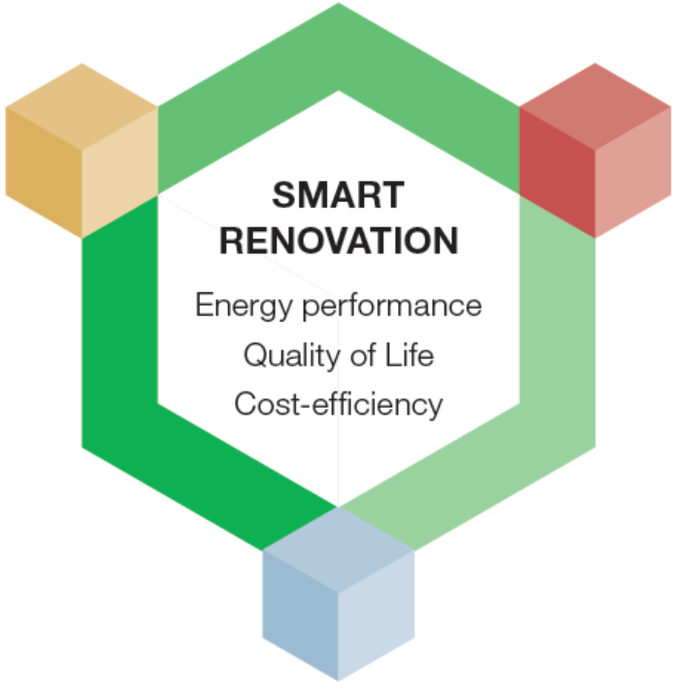
EU-GUGLE is co-financed by the European Commission under the 7th Framework Programme for Research and Technological Innovation, and is co-ordinated by CENER, Spain's National Centre for Renewable Energies.

The EU-GUGLE project

European cities serving as Green Urban Gate towards Leadership in sustainable Energy



www.eu-gugle.eu

Demonstrating the feasibility of nearly-zero energy building renovation models in view of triggering large-scale, Europe -wide replication in smart cities and communities by 2020.

- 6 years
- 6 Pilot cities: AACHEN, BRATISLAVA, MILANO, SESTAO, TAMPERE, VIENNA
- 3 associated cities: GOTHENBURG, GAZIANTEP, PLOVDIV
- 226,000 m² of living space renovated
- Target: up to 82% primary energy savings

The EU-GUGLE project

- Combine the latest research results relevant to smart renovation at district level;
- Demonstrate the technical, socio-economic and financial feasibility of sustainable renovation solutions for groups of buildings in 6 European districts;
- Integrate the results into clear, comprehensive and transposable ‘smart renovation models’;
- Trigger large-scale, Europe-wide replication in smart cities and communities by 2020.

VIENNA

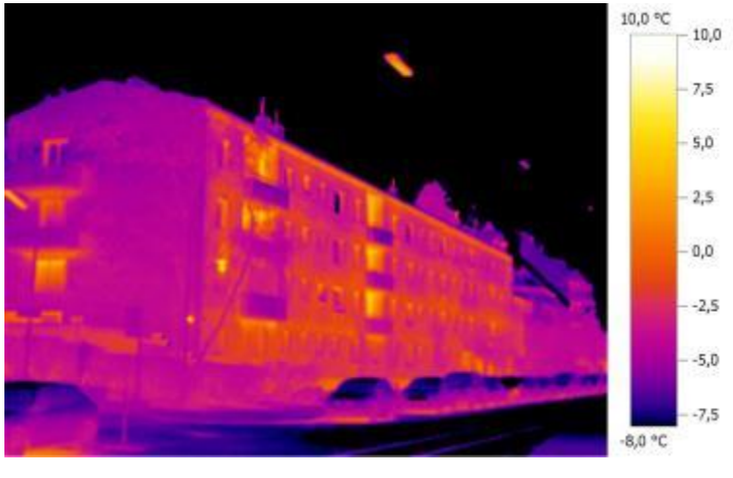
District	Penzing
Surface affected	~68,783m²
Type of buildings	residential buildings and social housing from the 50s and 70s, owned by tenants and flat owners
Target	Up to 61% primary energy savings

Technical measures:

- High insulation and decentralised ventilation.
- Thermo dynamic optimisation via simulation and monitoring.
- Multi-Active Façade combined with PV.
- Building Integrated PV (BIPV) combined with heat pumps, solar thermal integrated in district heating.
- Replacement of decentralised fossil heating systems by centralised renewable heating plants allowing contracting.

Non Technical measures

- Socio-economic evaluation.
- Participatory action research.
- Symbiotic integration of green power marketing.



Case study – Penzing 1

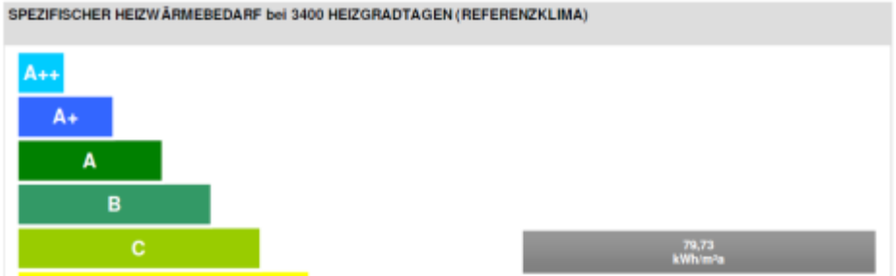
- Challenge is the cap of €1.50/m² additional monthly rent over 10 years.
- Considering energy poverty.
- Participatory actions to involve the tenants together with social forum (Wohnpartner).

Case study - Penzing 2

- Redensification – additional attic apartments (26) on top with:
  - Natural gas boiler (Central heating system) (135 kW).
  - Low temperature underfloor heating system (40 °C) individually controlled.
- Mixed model of tenants and new flat owners.

Case study - Penzing 2

- Minimization of heat losses, insulated envelope with U = 0.19 W/(m2K).
- Installation of new windows with U = 1.2 – 1.3 W/(m2K).
- Insulation of the cellar U = 0,19 W/(m2K).



Case study - Penzing 2

- Nogging piece with insulation of the roof (U = 0,17 W/(m2K).
- Energy-efficient elevators.

- Communication flow / quality assurance debates on weekly meetings.

Case study - Penzing 2

Case study – Penzing 2

- Step-by step realisation of the energy efficiency measures have been completed in August 2014.
- Distribution and intermediation among all involved parties.
- Few building users complain particular delays and disturbances, most of them seems satisfied as requested structural damages in the construction are repaired.

Case study - Penzing 2

Effizienzklassen	Klassengrenzen	Bestand	Sanierung
	[kWh/m²a]	[kWh/m²a]	[kWh/m²a]
niedriger Heizwärmebedarf			
A++	$HWB_{BGF,Ref} \leq$ 10 kWh/m²a		
A+	$HWB_{BGF,Ref} \leq$ 15 kWh/m²a		
A	$HWB_{BGF,Ref} \leq$ 25 kWh/m²a		
B	$HWB_{BGF,Ref} \leq$ 50 kWh/m²a		26,45

TAMPERE

District	Tammela
Surface affected	~30,000m²
Type of buildings	Apartment blocks mainly from the 70s, largely owned by private households.
Target	Up to 50% primary energy savings

Technical measures:

- Insulation measures (walls, windows, balcony doors, roof)
- Renewing the thermostat valves and adjusting the heating network
- Renovation of the heating system
- Solar panels
- Adding heat recovery to the ventilation system
- Air-source heat pump
- Metering for water consumption in every apartment
- Renovation of the drainpipe system
- Energy efficient lighting
- Remote monitoring of the properties

Non Technical measures

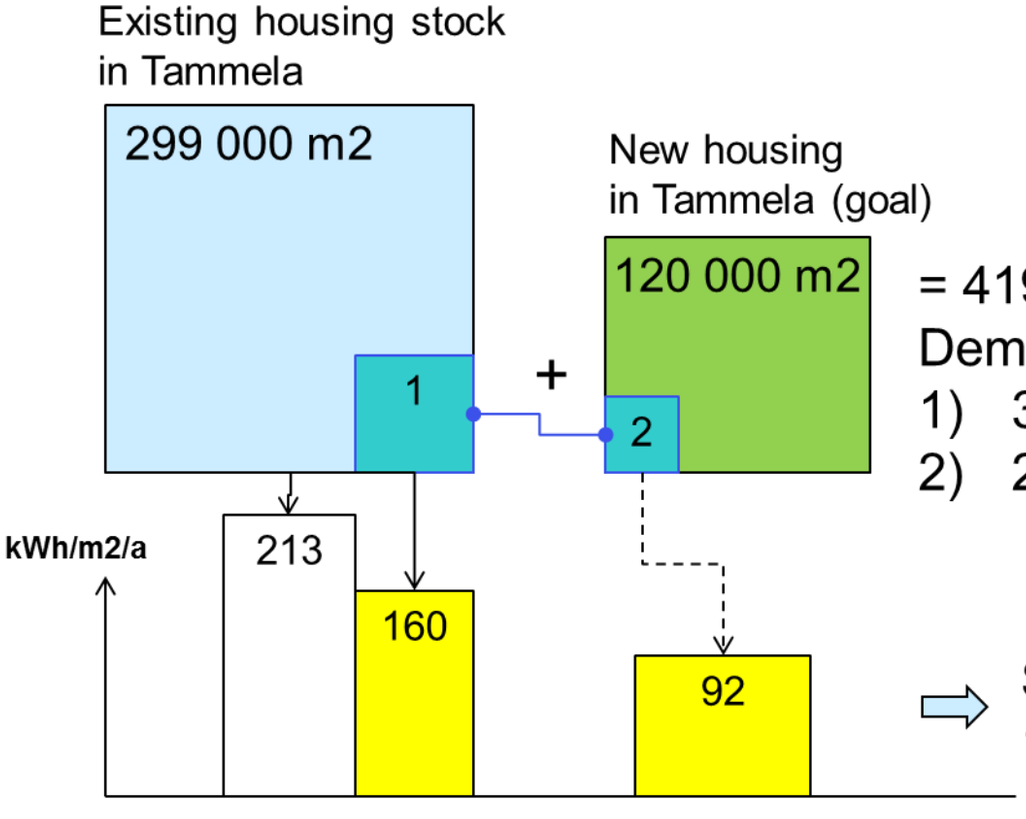
- Specialized events for the residents and the other parties on energy efficient and environmental friendly renovating, building and living
- Promotion of the use of bicycles

Case study - Tammela

- City of Tampere - Tammela as example for urban city development, ecological district as an innovation platform.
- **PPPP** - Tammela model pilot process is based on alliance working method.

Case study - Tammela

Case study - Tammela



= 419 000 m2

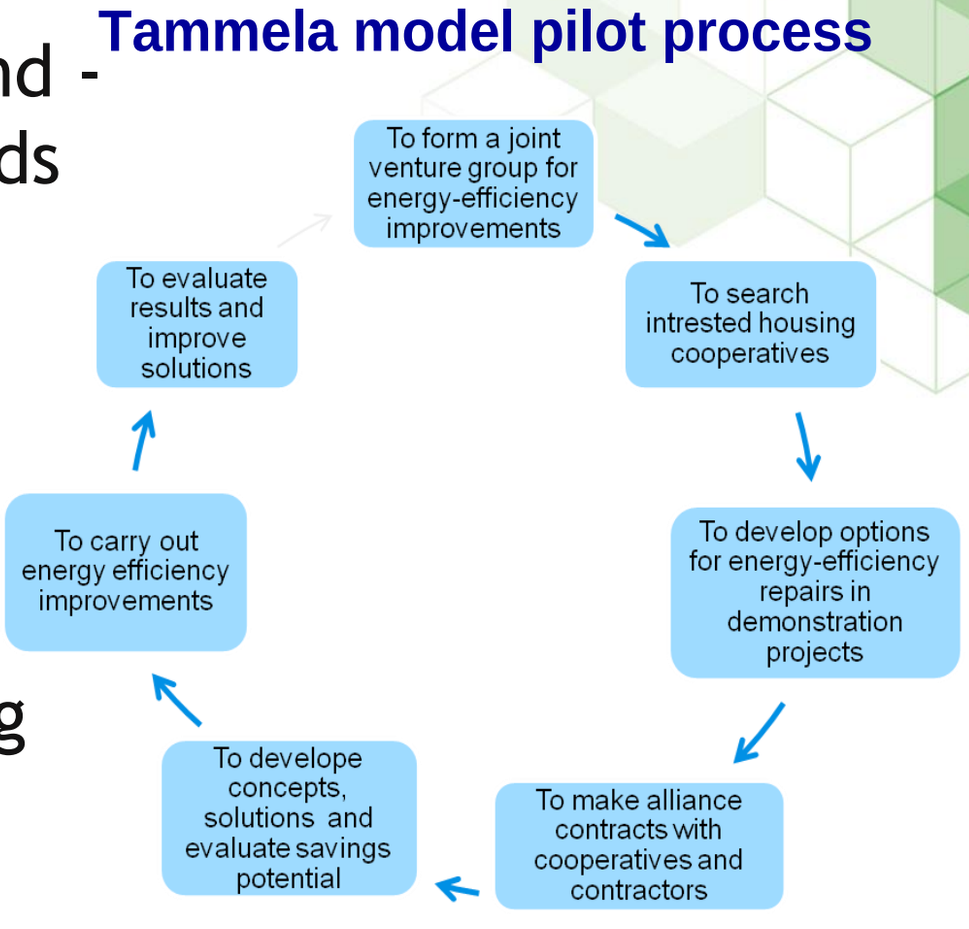
Demos

1) 30 000 m2 retrofit
2) 20 000 m2 low energy new buildings

Specific consumption goal
133 kWh/m2/a

Case study - Tammela

- Social-economical background - typical situation in households is lack of money (young couples) or unwillingness to invest (seniors).
- Beginning - motivating the housing companies.
- Workshop on decision making and financing.



Case study - Tammela

- Different kinds of surveys by VTT.
- Keeping the time schedule.
- Exchange of experiences among housing companies.
- Gaining higher quality and lower prices by pooling.

AACHEN

District	Aachen-North
Surface affected	~41,000m²
Type of buildings	Recent (70s) and historical buildings (20s-30s)
Target	Up to 65% primary energy savings

Technical measures:

- Insulation measures on facades, roofs, cellar ceiling, windows
- heat-recovery from ventilation
- heat recovering from the sewage and heat pumps integrated in a low-ex heat network
- district heating
- technical control systems for heat, electricity and lighting
- solar energy and efficient gas boilers
- presence detectors for lighting
- smart meters

Non-technical measures

- Energy efficiency rental fee and other agreements with tenants,
- communication measures and advisory activities to reduce energy consumption through consumer behaviour.

Case study - Aachen

Case study - Aachen

- Communication with tenants
  - Celebration of the completion of a section of construction as a 'thank you'' to tenants living in renovated spaces and information 'tenants2tenants' for the new construction sections.
    2 special events in 25.08.2014 and 25.04.2015
  - Presentation of the energy advisory boards in Aachen
  - Visit and explanation of the new heating system by heat pumps

Case study - Aachen

Buildings from the 70s
Using heat from the sewage network and 2 heat pumps
Heat recovery from ventilation system

AREA	WIESENTAL: A_RES_BEST 1			
	U-VALUE (w/m²K)			METHODS/
MEASURES	**REFERENCE**	**BEST**	**REALIZED**	**MATERIAL**
FACADE/WALL	0,24	0,84	0,232	12 cm thermal insulation 035 WLG
ROOF**	0,24	0,165	0,141	22 cm thermal insulation 032 WLG
GROUND FLOOR	0,35	0,271	0,271	8 cm thermal insulation 040 WLG
GLAZING	1,3	1,08	Ug 1,1/Uw 1,25	double glazing

Case study - Aachen

Realized measures:

- Balconies were removed and ones installed new to avoid thermal bridges
- Triple glazed windows
- Thermal insulation of the facade
- Insulation of the attic floor and the basement ceiling
- central heating from heat pumps (heat from sewage network and ventilation

Case study - Aachen

Listed buildings from 1923
Construction measures still ongoing, 8.901 m² (99 flats) finished, 5.475 m² started; Heating system variant investigated, not yet decided

AREA	JOSEPH-VON-GÖRRESSTR. 1-15: A_RES_BEST 2			
	U-VALUE (w/m²K)			METHODS/
MEASURES	**REFERENCE**	**BEST**	**REALIZED**	**MATERIAL**
FACADE/WALL	0,24	0,84	0,414 (back) 0,858 (front)	4/0 cm thermal insulation 032 WLG
ROOF**	0,24	0,141	0,141	20 cm thermal insulation 032 WLG
GROUND FLOOR	0,35	0,22	0,271	10 cm thermal insulation 035 WLG
GLAZING	1,3	1,3	Ug 0,6/Uw 1,00	triple glazing

Case study - Aachen

- New windows
- Insulation of the attic floor
- Insulation of the basement ceiling
- Insulation of the back facade (4 cm)
- LED lighting

New windows

- Information campaign on energy savings to tenants
  - Information events for the tenants of each construction phase (A_res_BEST 1, 2, 8) about 80 – 200 participants, following by onsite visits of all households to inform and offer individual help
  - Service board run by GEWOGE
  - Exhibition about EU-GUGLE and the planned/ conducted measures
  - Accompanying energy consultation with immediate measures for each tenant, conducted in their apartment
  - Providing an overview about all offers for energy advice and granting programmes in Aachen

Contact

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