PROJECT IS PARTLY FINANCED BY THE EUROPEAN UNION

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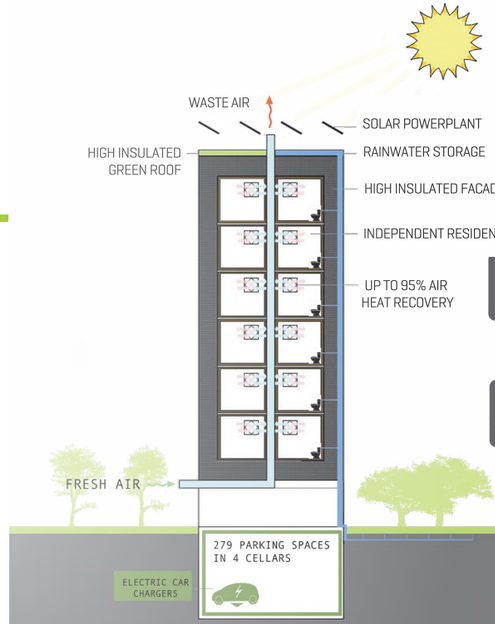
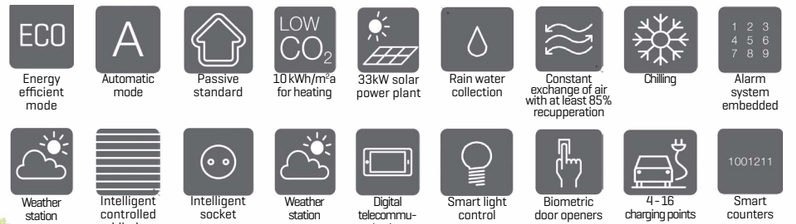
ENERGY EFFICIENT DEMO MULTIRESIDENTIAL HIGH RISE BUILDING
Grant agreement no:285209

EeB.ENERGY.2011.8.1-1
Demonstration of very low energy new buildings

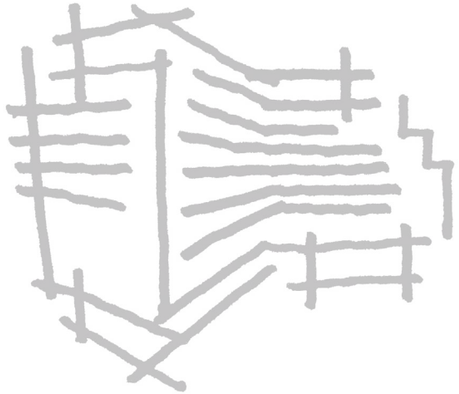
Starting date: 1st of January 2013
Project duration: 3 years

Coordinator: Akropola, d.o.o. Dunajska 21, 1000 Ljubljana, biro@akropola.si, tel.: +386 1 280 66 80





The overall objective of the project is to demonstrate and validate new technologies, concepts and systems used in EE-HIGHRISE project, in order to test and assess the technological and economical feasibility of innovative energy solutions in high rise demo building Eco Silver House.



THE OVERALL AIM

OF THE EE HIGHRISE ECO SILVER HOUSE PROJECT, SUPPORTED BY THE EUROPEAN COMMISSION (FP7-2011-NMP-ENV-ENERGY-ICT-EEB), is dissemination of new technologies, concepts and systems for sustainable, low-energy building to implement the concept of Demo Eco Silver House energy solutions. The fundamental principles of sustainable development of a highrise building are reflected in EE-highrise through comprehensive planning of the energy efficiency project savings, among other with renewable energy sources, perfect thermal insulation, wall soundproofing, high-quality air conditioning system with a recuperator, sun protection, extremely rational air-conditioning appliances, intelligent control and management of electric and mechanical devices, machinery and tools, ecological materials, use of rainwater, micro solar power station on the roof, green roof etc. and therefore it fulfils the requirement for: the passive standard (PHPP07) with the consumption of 10 kWh/m2 energy for heating per year. The most important innovations of the EE-highrise are the integration of the building envelope – HVAC system, intelligent integrated control system and renewable energy sources, fulfilment of the passive standard for a highrise building with 11 floors and 128 residential units.

TECHNIQUE IN THE APARTMENTS *Systems and equipments in the apartments related to the ICC (Intelligent control centre)*

HEATING	district heating / radiators
HOT WATER HEATING	30% energy savings for DHW heating
VENTILATION SYSTEM	constant exchange of air in the apartments
CHILLING	air duct integrated into the ventilation system
COOLING	integrated systems for automatic mode to ensure the comfort and pleasantness in the apartments
EXTERNAL BLINDS	automated external blinds / solar gains in winter and shading in the summer
LIGHTS CONTROL	living rooms / other rooms as an option
SOCKET CONTROL	selected socket in the apartment
IP VIDEODOMOFON	remote control for residents, vehicles acess to the garage and other entrances
BIOMETRICS DOOR OPENERS	independent biometric reader for accesing into building
CHARGING POINTS FOR ELECTRIC VEHICLES	4-16 charging points in garage / charged energy data on ICC
SMART COUNTERS	electricity, district heating, water, energy obtained from SE
RAINWATER HARVESTING/ COLLECTING	rainwater collecting system on the roof for flush toilet's tanks
ALARM / TECHNICAL SECURITY	indipendent alarm in each apartment / entrances, common areas and garage
WEATHER STATION	measuring current weather data/ on the roof, using of measured weather data on ICC
DIGITAL TELECOMMUNICATIONS	fiber optic connection to apartments

ICC control / intelligent control center for systems management
Control devices and systems in the apartment:

- HVAC (heating, ventilation and cooling)
- shades control
- lights and sockets control
- video intercom and access control - alarm
- plant watering
- weather station
- calling elevator before leaving the apartment / as an option
- consumption control by smart counters
- electric vehicle charged energy data control
- solar plant energy production control
- application such as Skype, etc / optional
- apartment video surveillance / optional
- internal building notes - shared bulletin board / optional
- multimedia / optional

-temperature, pressure, humidity, wind, solar radiation / displeyed on ICC

Implemented scenario for the ICC automatic control of all devices and systems in the apartments / scenarios: auto, indoor, out, ...

STAKEHOLDERS

- Local authorities, regional and national public bodies
- Municipalities associations and networks
- Public and private promotors
- Clients and users, investors and financial institutions
- Standardization bodies
- Architects' associations
- Federations and associations of construction organisations
- Networks of cities
- European and national sustainable building related platforms
- Building industry providers and installers
- Other European building related organisations
- Energy management agencies
- Local authorities, regional and national public bodies
- Research community

PROJECT PARTNERS

Akropola, družba za inženiring, projektiranje, trgovino in proizvodnjo, d.o.o.

REMTY-R, podjetje za inženiring in trgovino d.o.o., Slovenia

Robotina, podjetje za inženiring, marketing, trgovino in proizvodnjo d.o.o., Slovenia

Slovenski gradbeni grozd - GIZ (Construction Cluster of Slovenia), Slovenia

Gradbeni inštitut ZRMK d.o.o., Slovenia

R.E.D. SRL, Italy

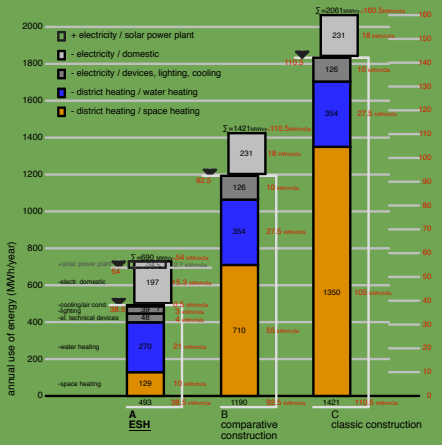
Elektron društvo sa ograničenom odgovornošću za proizvodnju trgovinu i građevinarstvo, Croatia

Univerza v Ljubljani, Slovenia

UMEA Universitet, Sweden

Cybrotech Limited, United Kingdom

1.1 Table of Comparison
with estimated energy expenses in the passive part of the ESH



A - ESH (Eco Silver House):
Our building, with a heating energy use of 10kWh/m2a, as determined by PHPP calculation, including energy use for water heating and electricity for cooling, air conditioning, technical devices and lighting. Electricity for domestic use is presented separately. (It is anticipated that proper automatic shading will render cooling unnecessary.) Gains from the solar power plant are included.

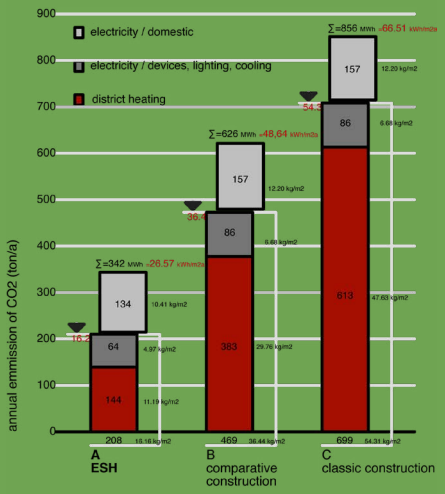
B- comparative construction:
The same building as the ESH, built in accordance with current standards and with a heating energy use of approx. 55kWh/m2a

C - classic construction:
An average multi-residential building of compact shape from the 80s, with isolated facade, double thermopane glazing and an estimated heating energy use of approx. 105 kWh/m2a. The calculated net living area inside the envelope (excluding balconies and terraces) is 12,870 m2.

sources: ZRMK, PHPP calculation

25.11.2010

1.2 Comparison table
annual CO2 emissions in the passive part of the ESH

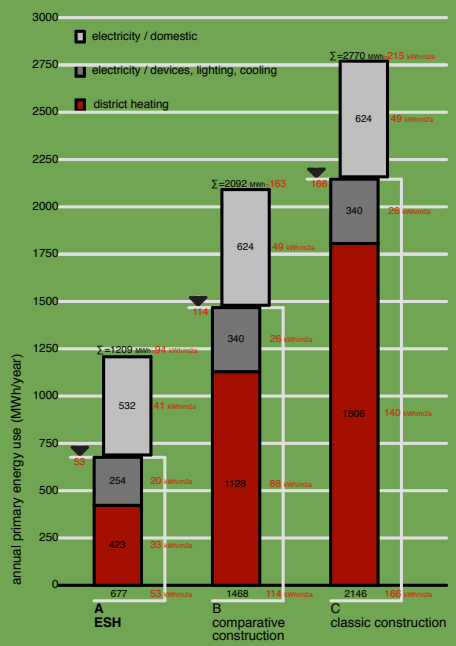


electricity:
characteristic values for electricity from the grid of Elektro Company Ljubljana are:
- Required primary energy: 2.70 MWh_{PRIM} / MWh
- CO_2 emissions: 0.680 tons / MWh

district heating:
characteristic values of the district heat network from Elektro Company Ljubljana are:
- Required primary energy: 1.06 MWh_{PRIM} / MWh
- CO2 emissions: 0.361 tons / MWh

sources: ZRMK, PHPP calculation, Elektro Ljubljana, Energetika Ljubljana

1.3 Comparison table
annual primary energy use in the passive part of the ESH



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