

Energy renovation of Ljubljana, the green capital

Partnerships to reduce our carbon footprint

Ljubljana, the European Green Capital 2016, is building its urban future in harmony with nature. The Energy Retrofit Programme of Public Buildings in Ljubljana. It is a new sustainable milestone. Together with our consortium partners, we have improved the energy efficiency of 48 buildings in Ljubljana during 2017 and 2018, and continued with the renovation of 11 more buildings in and around Ljubljana. It is the largest public-private partnership in Slovenia in the field of energy contracting, with Petrol assuming all the technical and economic risks of the project implementation and management.



RENOVATION

48 + 11 buildings



SAVINGS

€1.3 million/year



SAVINGS

9,282 MWh/year



DECREASE

ca. 3,500 tonnes of CO₂/year



INCREASE

to 51% or 56%



FINANCING

energy contracting model



IMPROVED CONDITIONS

for building users and staff



AN EXAMPLE OF GOOD PRACTICE AT HOME AND AROUND THE WORLD

'European Energy Service Award 2019' in the projects category

Award in the 'Energy Efficient Project' category at the Energy Days Conference 2019



PROJECT LEGACY

Raising awareness of the benefits of energy renovation
Education programme for schools

OBJECTIVES

- Energy renovation of buildings to achieve energy savings
- Reducing energy use and carbon footprint
- Increasing user comfort

CHALLENGES

- Buildings forming part of cultural heritage or under copyright protection
- Large scale of the project: a lot of coordination between a large number of stakeholders
- Careful planning of activities: schools and kindergartens involved; works carried out without disrupting school timetables and public services
- Buildings that had to be structurally adequately reinforced: additional permits and approvals
- Compliance with *the Energy Efficiency Regulations (PURES)* and *the Ordinance on the Priority Use of Energy Products for Heating in the Municipality of Ljubljana*

ACTIONS TAKEN

EOL-1: 48 buildings renovated (25 comprehensive)

- Renovation of the building envelope of approx. 38,000 m²
- Renovation of windows and doors of approx. 5,500 m²
- Installation of thermal insulation in the roof or attic of approx. 35,000 m²
- Renovation of 9 gas boiler rooms, 2 biomass boiler rooms, renovation of heating sources with the installation of heat pumps in 8 buildings, renovation of 18 heating stations in SDO
- Installation of 20 high-efficiency air-conditioning systems for building ventilation
- Renovation of the interior lighting of buildings with the installation of over 12,000 new LED lights and retrofit installation of over 5,200 LED lamps
- Installation of over 4,000 thermostatic valves

EOL-2: renovation of 11 buildings (7 comprehensive)

- Renovation of the building envelope of approx. 10,000 m²
- Renovation of windows and doors of approx. 2,500 m²
- Installation of thermal insulation in the roof or attic of approx. 7,000 m²
- Renovation of 5 gas boiler rooms, renovation of heating sources with the installation of heat pumps in 6 buildings, renovation of 2 heating stations in SDO
- Installation of 3 high-efficiency air-conditioning devices for

ventilation of buildings

- Renovation of the interior lighting of buildings with the installation of over 2,200 new LED lights and retrofit installation of over 30 LED lamps
- Installation of over 1,000 thermostatic valves

FINANCING

The energy renovation investment is shared in a public-private partnership:

Comprehensive energy renovations



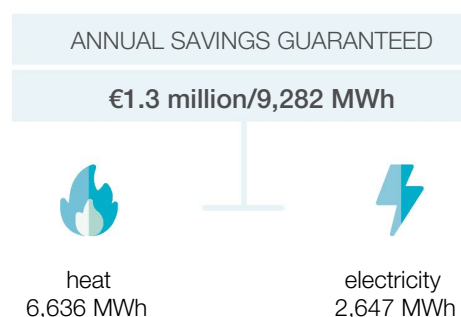
Partial technological energy renovations



PROJECT IMPACTS

Energy savings

The improved energy performance certificate has saved Ljubljana more than 9 million kilowatt hours per year, or more than €1 million in heat and electricity savings, enough to cover the energy costs of 585 households.



Increasing the use of RES

All comprehensively energy renovated buildings are supplied with an improved share of energy from renewable energy sources (RES) after renovation:



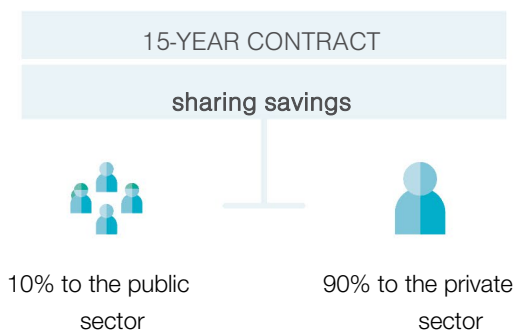
Environmental contribution

Energy renovations have reduced greenhouse gas emissions



Economic savings

The contract is signed for a period of 15 years. During this period, the contractor assumes the responsibility and the maintenance costs of all the measures implemented, according to the principle of energy contracting.



Educational contribution

- New 15-year training programme on water, energy and renewable energy efficiency
- Municipality of Ljubljana earmarks 10% of the savings for children's education

- In 2018, 18 schools in the Municipality of Ljubljana area were included in the programme, 42 departments with a total of 1,027 pupils in grades 4 and 6

CONTENT OF THE TRAINING PROGRAMME:

- The experimentation programme 'VODA'
- The robotics and energy efficiency programme 'CUBETO' and its journey home
- The 'Petrol Heroes and Hiško' programme, including energy efficiency games
- Tech Day with electricity saving topics

The programme is implemented by Zavod 404 and Montel Energetika.NET.



OTHER OPINIONS ON THE PROJECT

"The project has been extremely demanding, as we have been breaking new ground in this area. But now, the Ljubljana energy renovation project is a case-study of good practice, not only in Europe, but also more broadly."

Jelka Žekar,

Vice-Mayor of the Municipality of Ljubljana

"In the field of energy efficiency, the Municipality of Ljubljana has been renovating buildings owned by us since 2013, and since 2017 we have been increasingly implementing renovations through the public-private partnership model. In the framework of the Ljubljana energy renovation project (EOL1), together with our partners Petrol and Resalta, we have fully renovated 25 buildings, following the approach of energy contracting. The project has been extremely demanding, as we have been breaking new ground in this area. But now, the Ljubljana energy renovation project is a case-study of good practice, not only in Europe, but also more broadly. We are very proud of the project and we will continue with such projects and partnerships in the future."

Alenka Loose,

Municipality of Ljubljana Energy Manager

Jože Moškrič Primary School in Ljubljana

107.85 kWh/m²a,
Energy efficiency
class E

43.33 kWh/m²a,
Energy efficiency
class C



Kodeljevo Hall

173.14 kWh/m²a,
Energy efficiency
class F

46.41 kWh/m²a,
Energy efficiency
class C



Vodmat Kindergarten, Bolgarska unit

145.05 kWh/m²a,
Energy efficiency
class E

56.12 kWh/m²a,
Energy efficiency
class C



Tivoli swimming pool

174.61 kWh/m²a,
Energy efficiency
class F

24.25 kWh/m²a,
Energy efficiency
class B



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