



## Energy efficient building reconstruction

### Nature Park Papuk, Croatia

- Pursuit of zero energy building objective
- Environment protection improvement, especially in areas of significant and particular natural importance



#### Benchmark

Situation before the reconstruction

- 15.9 t CO<sub>2</sub>e/year
- 5.1 toe/year

#### GPP 2020 tender

Reconstruction of energy efficiency building

- 4.5 t CO<sub>2</sub>e/year
- 1.3 toe/year

#### Results

Reduction of:

- 11.3 t CO<sub>2</sub>e/year
- 292.9 t CO<sub>2</sub>e/25 years
- 3.9 toe/year
- 96.6 toe/25 years

## Contract tendered

- The Natural Park Papuk tendered an energy efficient building reconstruction comprising a) replacement of the heating and hot water system and the improvement of the thermal insulation (outer shell and windows).
- Replacement of heating and hot water system: Heat pumps instead of the existing liquefied petroleum gas (propane).
- Improvement of the thermal insulation through the replacement of the outer shell and windows.
- The tender was published in October 2015
- The cost of construction works according to executive project was 155 000 EU (excluding VAT).
- Total contract duration that included both procurement of equipment and performance of works was 90 days.



## Procurement approach

Tendering followed the open procedure, based on the following approach:

- Thermal insulation enhancement based on mineral wool which produce significant reduction of CO<sub>2</sub> emission. This high insulation efficiency has been used for maximum thermal comfort, but at the same time with high level of non-combustibility and very high acoustic performance which makes it highly sustainable.
- Thermal insulation enhancement included window system replacement: wood (larch) and aluminum biplane tilt&turn window system. Light, warmth and ventilation were the main objectives that has been followed in compliance with targeted energy efficiency effect. With replacement, heating, cooling and lighting costs has been minimized, but at the same time a design improvement touch has been also achieved.
- Aero geothermal heat pumps with built-hermetic compressors and heat provide heat, cool and hot water system which makes them comfort and energy saving and don't depend on the temperature of the outside air. System life is estimated at 25 years.
- Eligibility of bidder: must have minimum same value of construction works on same of similar degree of complexity experience

Award criteria: Lowest price

### Contract clauses

Upon completion of the contract, the selected bidder must provide a warrant that all the equipment installed and all work that has been done is according to contract. Also, warrant on quality of executed work in total duration of 2 years.

## Criteria development

The ambition of the public tender was to decrease the consumption of fossil energy. Therefore, Nature Park Papuk made a significant and strong turnaround. It all started with the idea that being a park of nature – it's a must to be a leader and example on how to enhance positive impact on nature in order to preserve it.

Series of environmental criteria were implemented in detailed technical specification which were part of public procurement procedure documentation. Wide range of sources were employed to design these technical specification data which led to successful bidder selection.

## Results



The basis for the calculation of energy savings and CO<sub>2</sub> emission reductions is described below. The results are as follows.

	CO <sub>2</sub> e emissions	Energy consumption
Low Carbon Solution	4.5 t CO <sub>2</sub> e/year	1.3 toe/year
Benchmark: Conventional electricity	15.9 t CO <sub>2</sub> e/year	5.1 toe/year
Annual savings	11.3 t CO <sub>2</sub> e/year	3.9 toe/year
Total savings (25 years)	282.9 t CO <sub>2</sub> e	96.6 toe

### Calculation basis

As a benchmark, we used the energy consumption of the old heating and hot water system (propane). This system consumed 59 817 kWh per year.

Emission factor for liquified gas: 265 g CO<sub>2</sub>/kWh (see GPP 2020 vehicles calculator).

The new heating and hot water system (heat pump) is going to use 14 874 kWh electricity. This figure is based on the project designs made by an authorized engineer.

Emission factor for the Croatian electricity mix: 305 g CO<sub>2</sub>/kg (see GPP 2020 energy contracting calculator).

## Lessons learned

National Action Plan for Green Public Procurement 2015-2017 with a view till 2020 accepted on August 26<sup>th</sup> 2015 predicted at least 70% of green public procedures to be conducted. This procedure is one step close to achieve the set goals. Public procurer must have a well-thought-out reference design and know where there is any room for improvement. Gains of procedure justify the costs: reduction of carbon emission and positive impact on nature. Possibly on further similar public procedures that shall be conducted MEAT could be use as award criteria.

## Contact

4



Nature Park Papuk

34300 Velika

Stjepana Radića 46

Croatia

[kontakt@pp-papuk.hr](mailto:kontakt@pp-papuk.hr)

[www.pp-papuk.hr](http://www.pp-papuk.hr)

## About GPP 2020



GPP 2020 aims to mainstream low-carbon procurement across Europe in support of the EU's goals to achieve a 20% reduction in greenhouse gas emissions, a 20% increase in the share of renewable energy and a 20% increase in energy efficiency by 2020.

To this end, GPP 2020 will implement more than 100 low-carbon tenders, which will directly result in substantial CO<sub>2</sub> savings. Moreover, GPP 2020 is running a capacity building programme that includes trainings and exchange. – [www.gpp2020.eu](http://www.gpp2020.eu)

## About PRIMES



Across six countries in Europe; Denmark, Sweden, Latvia, Croatia, France and Italy, PRIMES project seeks to help municipalities overcome barriers in GPP processes, many of which lack capacity and knowledge.

PRIMES aims to develop basic skills and provide hands-on support for public purchasing organisations in order to overcome barriers and implement Green Public Purchasing. This will consequently result in energy savings and CO<sub>2</sub> reductions. – [www.primes-eu.net](http://www.primes-eu.net)



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