

BEST PRACTICE IN CZECH REPUBLIC – ENERGY EFFICIENT CITIES

BASIC INFORMATION

Title of the Best Practice

Thermal renovation and installation of air recuperation in Special primary school Turkmenska

Energy efficiency measures implemented in the building:

Reducing heating demand: improving the heat insulation, changing of heat source and installation of local air recuperation in the whole school

Location:

City: Vsetín

Region: Zlín Region

Country: Czech Republic

<https://goo.gl/maps/EJ2y3YBLXhpvmdhn7>

Partners involved:

Owner and Operator

Special primary school turkmenska
Turkmenská 1612, Vsetín 755 01
Tel. 00420571411824
info@zsms-turkmenska.cz

Planner and Architect

Ing. PETR BRAVENEK projektová kancelář s.r.o.
Ústí 50, 755 01 Vsetín
Office: Dolní Jasenka 215
755 01 Vsetín
IČ 28561279
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Building technology planning

Tespora profi s.r.o.
Na Příkopě 814
755 01 Vsetín
www.tespora.cz

Implementation year: 2017 - 2018

2017 heat insulation and air recuperation, 2018 heat source

Photos:





Source: Energy agency of the Zlín region

SYSTEM CHARACTERISTICS

Brief Description:

With the support from the Energy Agency of the Zlín Region the municipality submitted the application for funding to the national Operational Programme Environment 2014-2020. The application succeeded and the project was approved for funding. The final share of the subsidy was 23,6 % from the overall investment costs.

The outer walls were improved by 16 cm of EPS with $\lambda = 0,035 \text{ W/(mK)}$ (U-value were reduced to 0,189-0,217 $\text{W/(m}^2\text{K)}$ depending on the initial construction). The roof were insulated with 280 mm mineral wool with $\lambda = 0,037 \text{ W/(mK)}$. The existing windows with an average U-value of 2,7 $\text{W/(m}^2\text{K)}$ were replaced by new plastic windows with a U-value of 0,9 $\text{W/(m}^2\text{K)}$. The doors were improved with $U = 1,2 \text{ W/(m}^2\text{K)}$.

Because of the inadequate indoor environment air recuperation the air recuperation for whole school was projected with the overall power of 7 100 m^3/h .

Nowadays, the heating demand of the building is 87 $\text{kWh/(m}^2\text{.a)}$, which means C-class for this type of building. The building wasn't reconstructed to the A-class because of the inadequate cost for the material and the benefit is too speculative.

Energy management has been implemented on this building for ten year and EM is carried out by the Energy Agency of the Zlín Region.

Thermal reconstruction of the building envelope

The outer walls were improved by 16 cm of EPS with $\lambda = 0,035 \text{ W/(mK)}$. The roof were insulated with 280 mm mineral wool with $\lambda = 0,037 \text{ W/(mK)}$.

Windows and doors

The existing windows with an average U-value of 2,7 $\text{W/(m}^2\text{K)}$ were replaced by new plastic windows with a U-value of 0,9 $\text{W/(m}^2\text{K)}$. The doors were improved with $U = 1,2 \text{ W/(m}^2\text{K)}$.

Building technology

Cooling: no requirement for cooling.

Ventilation system: There are 71 local air-units installed with overall power 7 100 m^3/h .

Heat technology: 20 years old natural gas boilers were replaced by the new natural gas boilers with the much higher efficiency of burning natural gas.

Energy management has been implemented on this building for ten year and EM is carried out by the Energy Agency of the Zlín Region.

FINANCIAL SOURCES AND FINANCING DETAILS

Total investment value:

854 198 €

Sources of financing:

This project was co-financed by the Operational Programme Environment of the Czech Republic with subsidy € 201 983; and by the Zlín Region.

Electricity savings (MWh/year):

0; because of the additional ventilation system

Or fuel savings (kg or m3 or kWh or GJ):

Reduction of natural gas from 1451 GJ before project implementation to nowadays 747 GJ which means 65 kWh/(m2.a) for the heating after the reconstruction and installation of local air-recuperation.

Cost savings (EUR/year):

9 856 € per year; +/- 0 electricity costs, because of the additional ventilation system

PROJECT IMPLEMENTATION BENEFITS

Overall reconstruction of the school has positive effect on the energy consumption and long-term sustainability of the whole project.

Project has generally improved visual appearance of the whole building.

Mechanical air-ventilation is necessary for the suitable indoor climate. Visible Benefit is the comfortable place for the teachers and students.

ADDITIONAL INFORMATION

Energy Agency of the Zlín Region is continuously monitoring the consumption of the natural gas, electricity and water consumption of the buildings related to this project and related to whole building.

On the picture below you can see the consumption of the natural gas in the school.

Spotřeba zemního plynu [m³]

Kategorie - školy. Podkategorie - ZŠ/MŠ (praktické a spec.).

Základní škola, Mateřská škola a Praktická škola Vsetín, Turkmenská (IČO 70238898), Vsetín, Turkmenská 1612, PSČ 755 01, Třetina Roman, Mgr. (feditel), e-mail: tretina.roman@zsms-turkmenska.cz, tel.: 571 411 824

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rok	leden	únor	březen	duben	květen	červen	červenec	srpen	září	říjen	listopad	prosinec	celkem rok
2008	5 589	5 130	4 519	2 260	606	301	219	160	1 827	2 048	4 068	4 329	31 056
2009	6 937	5 164	4 691	754	178	237	20	68	331	2 433	3 542	4 377	28 732
2010	6 086	4 987	4 287	1 762	913	477	187	210	693	3 136	3 683	5 903	32 324
2011	6 006	5 334	4 137	1 655	588	325	238	235	297	2 402	3 940	4 962	30 119
2012	4 913	6 356	3 311	1 674	297	292	221	238	326	2 137	3 856	6 157	29 778
2013	7 137	5 769	6 367	2 695	402	371	237	130	764	1 810	4 886	5 275	35 843
2014	5 522	4 334	3 130	1 299	808	277	202	200	537	1 303	3 568	5 265	26 445
2015	5 644	5 078	4 196	2 246	448	235	222	241	423	2 761	3 778	5 409	30 681
2016	6 326	4 712	4 762	2 175	635	245	207	158	257	3 250	4 490	5 669	32 886
2017	7 950	5 121	4 031	2 644	927	244	116	137	483	1 620	2 096	2 956	28 325
2018	3 280	3 444	3 998	1 244	532	401	25	27	307	2 273	3 077	4 281	22 891
2019	4 564	2 894	2 146										9 604

