POLISH AND NORWEGIAN CITIES
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THERMAL RETROFITTING OF THE NATIONAL LIBRARY IN WARSAW

Sector: Energy efficient buildings

Timeframe: 2012 – 2015

Location: National Library,
213 Niepodległości str., Warsaw, Poland


Photo: the National Library

PROJECT BACKGROUND

Warsaw (over 1.7 Mio inhabitants) is the capital of Poland and the main city of the Mazowieckie Voivodeship. It is also the biggest city in the country located in its central-eastern part. Warsaw is an active member of the Association of Municipalities Polish Network "Energie Cités" and one of the first Polish signatories of the Covenant of Mayors, which joined this initiative already in 2009. In 2011 the city developed and adopted its Sustainable Energy Action Plan until 2020.

The National Library in Warsaw is the central and the biggest Polish library, as well as the most important humanities-oriented scientific repository. It is the main archive of Polish literature, national bibliographic agency, research institute and an important methodical center supporting other libraries in Poland. The library occupies a complex composed of the three units connected with internal gardens. It is located at 213 Niepodległości street, in the Ochota quarter.

PROJECT DESCRIPTION

Thermal retrofitting of the library was possible thanks to the funds from the Green Investment Scheme (GIS) managed in Poland by the National Fund for Environmental Protection and Water Management (NFEP&WM). Warsaw applied for and received funding within the 1st call for proposals announced under the priority programme "Part 5 - Energy management in the facilities of selected public finance sector entities". Supported project, entitled "Energy management in the buildings of the National Library" foreseen the modernisation of the whole complex.

The National Library was built in the period of the Polish People's Republic, often from poor-quality material, therefore its buildings required replacement of the most of the elements and installations. In the years 2012-2013 thermal retrofitting works were conducted in 12 buildings (A1-A6, B, B1, C, D, E and F). Scope of the works included thermal insulation of 13 000 m^2 of external walls and flat roofs and replacement of 6 000 m^2 of windows. The façades could not have been insulated from the outside due to their structure (curtain façades) and the necessity to preserve original proportions of buildings. The insulation material used were the Multipor insulation boards, which have good insulation properties and are easy to mount on the walls. Installation of mineral boards from the inside brings many benefits: possibility of heating up the building fast, reducing energy bills (approx. by 50% per year), increasing building users' comfort, improving microclimate in the interiors and ensuring safe and durable insulation. The retrofitting works included also modernisation of the central heating systems

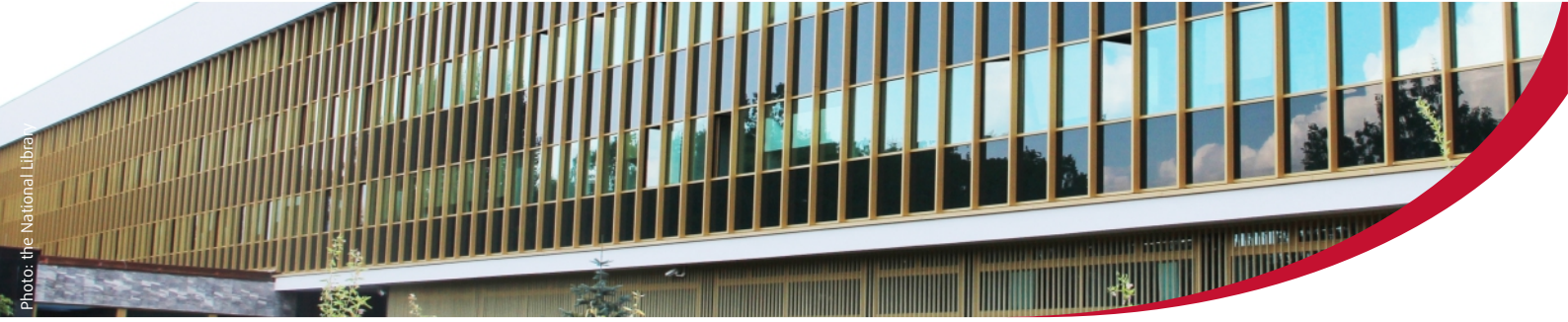
Photo: the National Library

consisting in the replacement of vertical and horizontal pipelines (approx. 20 000 m), replacement of approx. 1 100 radiators and installation of measurement units. Moreover, approx. 12 400 luminaires were replaced with new ones with energy efficient light bulbs. This activity was accompanied by the modernisation of the installation and replacement of lighting boards.

Another project proposal was submitted within the 2nd call for proposals announced under the GIS priority programme "Part 5 - Energy management in the facilities of selected public finance sector entities". It received funding and - as a result - ventilation and air conditioning systems were modernised in the library's main building at Pole Mokotowskie (building C). The scope of modernisation works conducted in the period 2014-2015 included replacement of electrical and tele-technical installations and introduction of BMS covering air conditioning system, ice water unit and district heating substation. The aim of the BMS is to integrate different installations existing in the library's building and to manage and optimise their operation. Modernisation of ventilation and air conditioning systems in building C was completed in May 2015.

FINANCING SCHEME

Main thermal retrofitting works were conducted in the period 2012-2013 within the project "Energy management in the buildings of the National Library" co-financed from the Green Investment Scheme. The scheme was launched to fund environmental projects using financial resources obtained by Poland through the sale of excessive Assigned Amount Units (AAUs) assigned to the country under the International Emission Trading scheme. These resources can be used only for environmental protection purposes related to the reduction of GHG emissions (so called "greening"). The investment implemented in the National Library was funded using money coming from the sale of AAUs to the Japanese entity named NEDO – New Energy and Industrial Technology Development Organization, operating on behalf of the Japanese government. The investment received the highest co-financing from all the projects supported within the agreement signed with NEDO. The total cost of the modernisation works came to approx. 26.6 Mio PLN (approx. 6.18 Mio EUR). Co-financing from the NFEP&WM reached 20.7 Mio PLN (approx. 4.81 EUR). Nearly 4 Mio PLN (approx. 0.9 Mio EUR) was covered from the budget of the Ministry of Culture and National Heritage and the remaining amount was covered from the National Library's own funds.

Modernisation of ventilation and air conditioning systems in building C was also financed by the NFEP&WM within the Green Investment Scheme, priority programme "Part 5 - Energy management in the facilities of selected public finance sector entities" (2nd call for proposals). The total investment cost included in the grant agreement came to 5.3 Mio PLN (approx. 1.2 Mio EUR).

Photo: the National Library

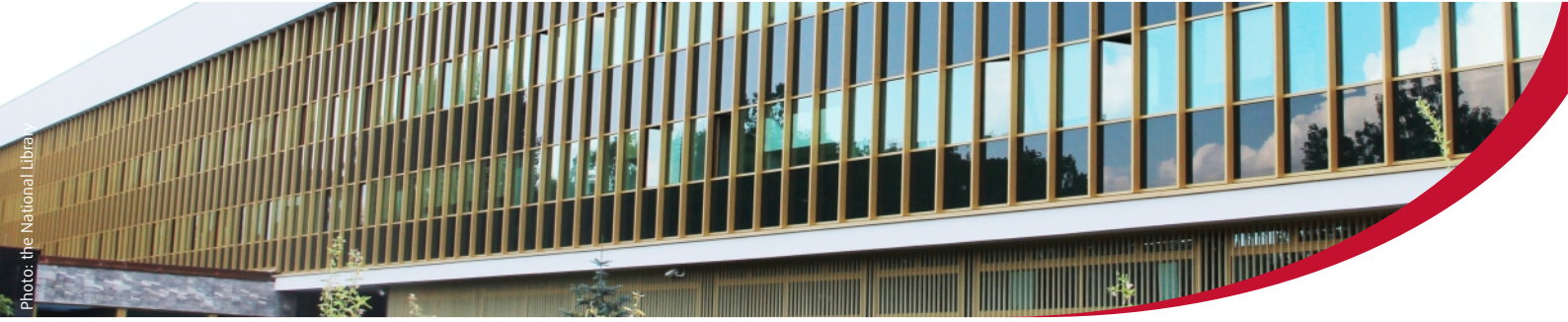
Photo: the National Library

PROJECT RESULTS

Conducted retrofitting works significantly improved thermal conditions of the walls and reduced heat losses. Installed mineral insulation boards improved microclimate in the interiors, which was very important for ensuring adequate comfort of the building users. After the renovation, buildings' appearance is accordant with the original assumptions of the modernist project from 1963 (during the construction in the period of the Polish People's Republic these assumptions could not have been completely implemented). Now, the National Library is a good example of Polish modernist architecture from the 60s - functional and environmentally friendly.

Thermal retrofit of the 12 buildings occupied by the library contributed to the reduction of CO_2 emissions by 2 278 Mg/a (nearly 50% decrease), while reduction of heat consumption reached 19 717 GJ/a (66.2% decrease). The investment brought not only environmental benefits, but also economic ones as it reduced library's electricity and heating bills.

Modernisation of ventilation and air conditioning systems in building C, conducted in the period 2014-2015, should result in further CO_2 emission reduction amounting to 2 262 Mg/a.


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MORE INFORMATION

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