

MONITORING REPORT

OF

SUSTAINABLE ENERGY

ACTION PLAN (SEAP)

THE CITY OF OSTRAVA

Ostrava, August 2016

INTRODUCTION

This monitoring report of the Sustainable Energy Action Plan of the City of Ostrava (hereinafter MR SEAP) assesses the period of the years 2014 - 2015 and builds on the final version of the Action Plan, prepared in November 2013. The monitoring report was developed in accordance with the "Reporting Guidelines SEAP and Monitoring (methodological and technical reference manual of the Covenant of Mayors, May 2014) and the data annex was inserted into the system using the current "New Monitoring Template".

This monitoring report summarizes the results of the Sustainable Energy Action Plan for nearly a third of the first SEAP implementation period and demonstrates significant progress in achieving the objectives of SEAP, which exceeds the given proportion of the planned savings. In this context we should emphasize that the monitoring report contains especially those data and expected results of measures yet known, not the operational energy savings reached in the given period. In some cases, the effects of projects can be evaluated not sooner than in the next SEAP monitoring period, as many of them were not completed until the end of 2015 (depending on the end of the programming period ESIF 2007-2013 N+2) and it was not possible in fact to compare the original and current energy consumption.

Based on the results found we can state that the Sustainable Energy Action Plan of the City of Ostrava brought about significant positive changes in terms of reducing energy consumption, thereby reducing costs, and in particular the reduction of emissions of GHG associated with energy production, which was not produced due to the implemented measures.

MEASURES TAKEN IN THE PERIOD 2014 - 2015

ENERGY SAVINGS IN PUBLIC BUILDINGS

The following major-by-size measures were completed in the period, bringing significant energy savings while fulfilling SEAP. Energy audits were carried out for these projects, which form the basis for the energy savings and CO₂ reduction reported.

- Set of measures Ecotermo II A - insulation and revitalization of 9 city-owned buildings, mostly elementary schools, as well as kindergartens, a retirement home, a fire station and a public library.
- Set of measures Ecotermo III - insulation of 6 city-owned buildings, mostly elementary schools, as well as kindergartens and a retirement home.
- Set of measures – “Reduction of energy consumption in Ostrava Zoo” - insulation of 6 buildings, including animal pavilions and service buildings.
- Set of measures - „Energy savings in City Hospital of Ostrava” – insulation of 8 building in the area of the above hospital.
- Significant individual revitalization projects – complex reconstructions of elementary school building as well as library

Potential of overall energy savings of these sets of measures consists of **27 thousand GJ/year**, which corresponds to CO₂ emissions reduction of approximately **2,1 thousand tons/year**.

In addition to these major projects there were other individual projects of reconstruction and revitalization of city-owned buildings implemented. Their main objective was to improve the technical condition of the buildings, while the reconstruction has also brought a reduction in their energy consumption. Since the primary objective of these complex projects were not energy savings, the energy audits were not carried out and the reduction in energy consumption has not been quantified precisely yet (it may be implemented later by comparing the consumption in the next SEAP monitoring period).

However, we can say that the total sum of all the measures implemented (projects that include energy audits and projects with energy savings estimated only) creates an expected saving of at least **42,4 thousand GJ/year**, and the associated CO₂ emissions reduction of about **3,9 thousand tons/year**.

FINANCES SPENT ON ENERGY SAVINGS IN PUBLIC BUILDINGS

The investment costs of projects whose savings are reported for the years 2014 - 2015 through energy audits (9 partial projects of set of measures Ecoterma II A, 6 partial projects of set of measures Ecoterma III, 6 partial projects of set of measures the Zoo, 8 partial projects of set of measures Energy Savings in the City Hospital of Ostrava and two significant individual projects), accounted together for **11,5 million EUR** (the rate CZK/EUR used is 1:27).

In addition to these figures showing the costs of projects that correspond to the energy savings calculated through energy audits, a sum of all costs that were spent in the past two years on insulation within the complex reconstruction of city-owned buildings is **17,3 million EUR**.

PERFORMANCE OF MEASURES OF THE ACTION PLAN

MEASURE 1 - INTRODUCTION OF ENERGY MANAGEMENT SYSTEM IN BUILDINGS OWNED BY THE CITY OF OSTRAVA

The establishment of the position of the City Energy Manager

A separate position of an energy manager has been set up at the municipal office in order to ensure effective and systematic implementation of the Sustainable Energy Action Plan and its monitoring. His main tasks, in connection with City of Ostrava signatory in Covenant of Mayors, are:

- design and implementation of systematic measures and standardization in the field of city energy management
- design of the structure and implementation of complex database systems to enable effective energy management of the city and its organizations
- ensuring continuous monitoring of fuel consumption, energy and cost evaluation of the operation of city-owned buildings and facilities
- evaluation of the benefits of projects of energy saving measures already implemented.

- design, preparation of projects and search for suitable grants for implementation of new measures and managing operation of systems or systemic measures already established
- and, of course, tracking and monitoring of the implementation of the Sustainable Energy Action Plan

The total energy consumption of city-owned buildings in Ostrava (schools, kindergartens, health and social facilities, etc.) was not monitored yet in an unified system, not on the level of the municipal office nor on the level of urban districts.

One of the key anticipated benefits of the energy management system proposed is the evaluation of any projects or activities of the city in terms of energy consumption, but also the potential energy benefits or synergies the projects could generate. The proposed introduction of centralized monitoring of energy consumption and information through the establishment of a system for the collection and evaluation of energy and service related data is another measure which has great potential to contribute to the overall increase of energy efficiency and the development of environmental awareness and thus the behavior of the city of Ostrava. The above measures will be also linked in the context of the intended implementation of ISO 50000 with the outlook to achieve certification of a comprehensive system of city energy management. Currently the energy manager is also responsible for activities of the pilot phase of implementation of the standard ISO 14000 for the building of Ostrava municipality office, concerning the environmental aspects mentioned above and in direct relation to the planned implementation of the city energy management.

MEASURE 2 - GREENING OF LOCAL HEATING SYSTEMS

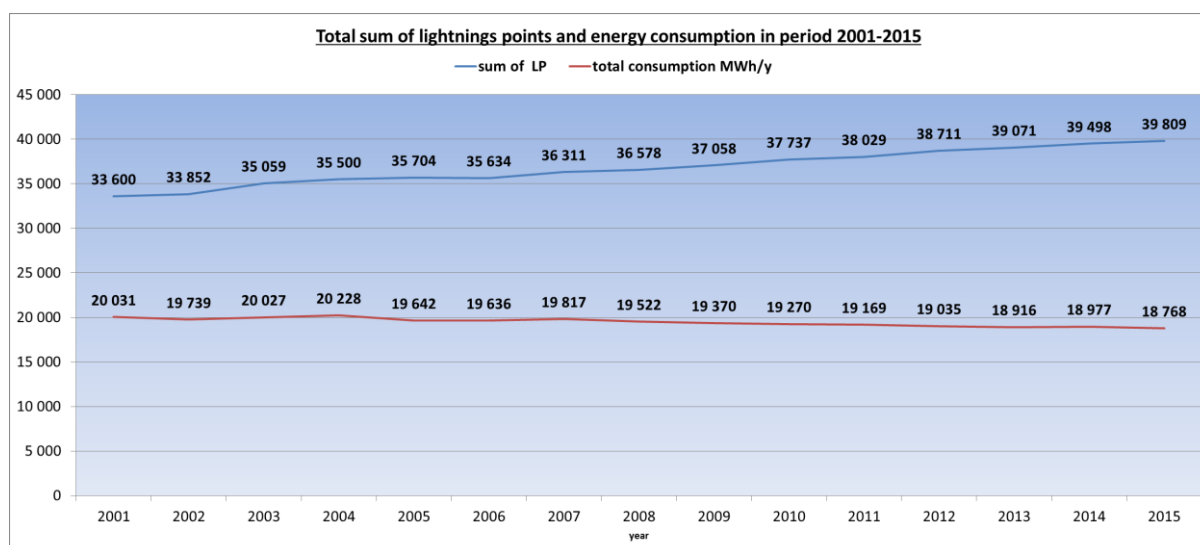
The Moravian-Silesian region has long been struggling with poor air quality, therefore one of the measures for improving air quality in the region was also funding of replacement both of generationally obsolete or unsatisfactory as for the emissions concern boilers in homes for modern low-emission boilers. The replacement was funded from the Ministry of Environment and the Moravian-Silesian region office in the period. This relatively large-scale replacement not only resulted in reduction of polluting emissions from local heating systems, but also it reduced energy consumption (due to greater efficiency of modern boilers) and thus also CO₂ emissions.

The last of the repeated calls for funding the replacement of boilers in households was launched in 2014, replacing boilers itself took place in 2015. Replacing 226 boilers in the city of Ostrava households led until 2015 to savings of about **21 thousand GJ/year** and CO₂ emissions reduction of **794 t/year**.

Note: Energy savings and CO₂ emissions reduction are based on professional estimation on the basis of fuels used and the change in the use.

MEASURE 3 - SAVINGS IN PUBLIC LIGHTING

In accordance with the Sustainable Energy Action Plan modernization of public lighting system continued, including use of LED technology and renovation of lightning points, which replaced the previously commonly installed discharge lamps. LED lamps with built-in control are used from 2014 to renovate lightning points systematically (LED lights in general have been in use since 2010).



The chart above shows that the average consumption per light dropped from 0.485 MWh to 0.471 MWh between the years 2013 and 2015. The declining trend of energy performance of the public lighting system in Ostrava was caused by installation and use of modern technology and long-term pressure from public lighting management on designers to use lights of high-quality guaranteed parameters (technical, lighting, durability, design). However, the change in lighting cannot lead to reduction in lighting parameters of lighting system, as citizens of Ostrava are accustomed to a certain level lighting and there are also requirements to ensure security in public places.

In this period, the "Public Lighting Master Plan" was also updated. It confirmed the previously established trend of integrating modern methods and equipment of the lighting system and established a plan for further development of the system for the next period.

MEASURE 4 - GREENING OF PUBLIC TRANSPORT

Urban public transport is considered to be ecological transport, since there are more people transported per unit of distance travelled (also per amount of emissions produced) than in private car transport. There are 105 new low-floor buses running on compressed natural gas, which represent a significant contribution to improving the environment in Ostrava and at the same time cost savings of public transport operation. These 90 buses 12 meters long and 15 buses 18 meters long replaced roughly a third of "diesel" vehicle fleet of the Transport Company operating in Ostrava. Supply of the gas-powered buses is related to the launch of a new large-scale CNG filler. It belongs to the most powerful CNG fillers in Central Europe thanks to its parameters - output of 3,000 Nm³/hr. and filling 24 buses in an hour.

The investments in gas-powered buses and CNG filler present a value of 28,5 million EUR. They were funded 85% from the EU Structural Funds (Operational Programme Environment), 5% from the state subsidies (Ministry of Environment) and 10% was paid by the transport company.

The difference in CO₂ emissions between CNG and diesel buses is not as significant as in emissions affecting people's health. The use of CNG brings mainly the significant decrease of particulate matter emissions (PM₁₀, PM_{2.5}, NO_x and polyaromatic hydrocarbons whose concentration in Ostrava is one of the highest within the Czech Republic).

In terms of CO₂ emissions reduction, electric drive is significantly more effective, because it has no direct CO₂ emissions at the point of consumption. In line with SEAP, developing the electric bus fleet is being planned and steps are taken to its fulfillment depending on the funding possibilities. The strategic objective of the city and of the transport company is to achieve a 60% share of electric vehicles of the total number of vehicles in urban public transport by the year 2025. However, the use of 105 CNG buses only could save about **980 tons of CO₂/year**.

MEASURE 5 - BUILDING OF TRANSPORT TERMINALS

The principle of this measure is to promote the development of electric traction of public transport. Therefore, transfer terminals should be gradually built on the city outskirts in suitable locations and the operation of public transport to the city center should be arranged primarily in electric traction. Transfer terminals should provide comfortable transfers between suburban lines, which will terminate at these points instead of heading to the city center, and between electric traction of public transport, leading to restrictions on parallel operation of suburban lines and inner city public transport.

Transfer terminal "Hranečník" and three kilometer trolley bus lanes were built in the period 2014-2015, providing a connection between the transfer terminal and the city center. Construction of the lanes along with the construction of five barrier-free stops and reconstruction of the substation of a total value of 2,2 million EUR was funded 85% from the Swiss-Czech cooperation fund, the remaining 15% then from the municipal budget.

All the finished projects, the purchase of the CNG buses, the CNG filler and construction of the transfer terminal follow the strategy Green and Clean Ostrava 2025, which stated to be implemented in 2013 by the Transport Company to contribute to greening and increase of the comfort of public transport.

IMPLEMENTATION OF SUSTAINABLE ENERGY ACTION PLAN

COORDINATION GROUP, WORKING MANAGEMENT TEAM

A coordination group and a management team actually coordinated by the city energy manager, were established for the implementation of the Sustainable Energy Action Plan. They ensure cooperation between different departments of the municipality office and allow city management to supervise the meeting of individual tasks of the Action Plan.

The main task of the coordination group is "to implement specific selected projects of the city, which will reduce CO₂ emissions by at least 25% by 2020 compared to the baseline year for which the amount of CO₂ emissions was stated" (year 2000).

A key element of the management group was to establish the position of a city energy manager, whose tasks are described in detail in a separate chapter.

LINK TO STRATEGIC DOCUMENTS

Sustainable Energy Action Plan is a document valid on its own, but it also links all the key documents of the city development, namely:

- **Strategic Development Plan of the City of Ostrava** is an essential document determining the development of the city of Ostrava, it contains a number of strategic goals, including those in areas covered by SEAP (housing, public services, transport, etc.). The consistent significant

update of the Strategic Plan is taking place these days and a number of key stakeholders and the public are involved in it. It also takes into account existing valid documents, including SEAP. When selecting projects for subsequent funding, objectives of reducing energy consumption will also be taken into account. The update will be completed in 2016.

- **Strategy of Integrated Territorial Investment (ITI) of Ostrava agglomeration 2014-2020** is a document whose priorities include projects with the effect of reducing energy performance. The aggregate indicator of the impact in the ITI environment part is CO₂ emissions reduction, achieved also by energy consumption reduction.
- **Integrated Urban Development Plan:** Ostrava - Magnet for the region. The integrated plan takes into account the objective of reducing CO₂ emissions by 2020 through energy parameters of projects.
- **Urban plan:** SEAP maps the planned development of the city, residential buildings and public facilities in accordance with the definition of territory for development and character of individual development areas, provided by the urban plan.
- **Programmes of improving air quality** - in some areas of the city of Ostrava the limits for the concentrations of pollutants in the air are exceeded, or the allowed number of exceeding these concentrations. Short-term Programme on the Air Quality Improvement (Action Plan) was valid in the monitoring period, elaborated by the city of Ostrava in 2012. There are measures to improve air quality and to protect climate (mitigation of CO₂ emission as well as their synergy. At the beginning of the next monitoring period (April 2016) a Programme of improving air quality was launched for the agglomeration of Ostrava/Karvina/Frydek-Mistek. Its goal is to achieve the legally required air quality for pollutants whose limit values are exceeded in the agglomeration, in the shortest time possible.
- **Initiative EU Smart Cities** - City of Ostrava joined the EU's initiative called Smart Cities and Communities, whose aim is to promote both energy efficiency and use of renewables and new smart solutions in the field of energy performance of buildings, transport and use of information technologies.

OTHER PLANNED EVENTS AND MEASURES DURING THE PERIOD OF SEAP (UNTIL 2020)

CONTINUED GREENING OF LOCAL HEATING SYSTEMS - ENERGY SAVINGS IN THE RESIDENTIAL SECTOR

The replacement of solid fuel boilers for modern low-emission boilers continues with the possibility of funding. The owners of houses located in Ostrava have the opportunity to achieve replacement of their old boilers with more modern ones at nearly zero costs, because in addition to the contribution from ESIF, the contribution of the Moravian-Silesian Region and the City of Ostrava reduces the financial participation of applicants. Therefore the replacement is also available to residents with lower incomes who would otherwise be unable to ask for replacement due to financial obstacles (even 15% participation would be beyond their funding capability).

The subject of funding will be the replacement of the existing solid fuel heating source with manual stoking for more modern sources, including new solid fuel boilers, gas boilers and heat pumps. It is also possible to install solar-thermal systems in combination with the replacement of the boiler.

ALTERNATIVE TO INDIVIDUAL CAR TRANSPORT - BIKESHARING

Another means of reducing the impact of individual car transport is, besides offering high-quality and environmentally friendly public transport, enhancing the attractiveness of cycling and offer of bikesharing. This is also support of so-called clean transport. A plan is to establish about 40 hiring/parking spots with a capacity of about 600 bicycles. For effective and comfortable availability the spots should be located in a network of 0.3 square km density. Distances between spots will range from 150 to 600 m. The public is also involved in planning the project through proposing spots using a questionnaire as a part of updating the Strategic Development Plan of the City of Ostrava. In parallel, the city also continuously adapts the conditions for safe and easy cycling, which is a necessary part of bikesharing operation.

A necessary step is also education in the field of so-called clean transport in order to increase the attractiveness of cycling. The concept of bikesharing and cycling is intended as an alternative for the daily lives of citizens and it should replace a part of individual car traffic, which is still being perceived as prestigious and reflects the social status of the user. Awareness must be focused in this direction.

CONTINUED GREENING OF PUBLIC TRANSPORT VEHICLE FLEET AND THE FLEET OF OSTRAVA AND MUNICIPAL ORGANIZATIONS

A fleet renewal in accordance with the principles of "clean mobility" is planned even outside the transport company – i.e. among users, which is the municipality itself, city districts and municipal organizations. Currently the city districts and municipal organizations are interested in 70 CNG buses (of which transport company demands 40-50 buses) and 50 electric vehicles (of which the transport company demands 40 electro-buses). The 40 electro-buses would mean savings of cca **2900 tons of CO₂ per year**.

PREPARATION TO INITIATE COMMITMENT ON CO₂ EMISSIONS REDUCTION IN 40% BY 2030 AND TO ELABORATE „SECAP“

The city of Ostrava is considering the adoption of a new commitment to reduce CO₂ emissions of 40% by 2030, in accordance with the currently articulated vision of development as well as on the basis of successful fulfillment of existing commitments. Through this step Ostrava would join a number of major cities which are generally perceived as cities contributing to solving global problems, including climate protection, through their sustainable development. In this context a new SECAP plan is currently being prepared for the period until 2030. It will take into account not only the commitments taken or planned, but also outputs of the Strategy of Adaptation of the City on Climate Change, which is being to be elaborated by the beginning of 2017.

MONITORING REPORT CONCLUSION

The rate of implementation of measures of the Sustainable Energy Action Plan of the city of Ostrava in the monitoring period 2014 - 2015 indicates that, along with the benefits of all the other measures in this area, the established target of reducing CO₂ emissions by 25% in 2020 compared with the initial balance year will be met.