

**ECO-MANAGEMENT AND AUDIT SCHEME (EMAS)
FUNCTIONING ON THE EXAMPLE OF THE WATER SUPPLY
AND SEWERAGE JOINT STOCK COMPANY OF THE
CZĘSTOCHOWA DISTRICT**

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Abstract: The article presents pro-ecological activities realized in the past years and planned for the years 2014-2016 by The Water Supply and Sewerage Joint Stock Company of the Czestochowa District. It highlights numerous benefits stemming from the implementation of EMAS in entrepreneurship. The Water Supply and Sewerage Joint Stock Company of the Czestochowa District is one of few companies in the field which obtained the Integrated Management System Certificate. The present article presents, among others, the identification of the environmental aspects, environmental effectiveness ratio undertaken by the Company in order to implement the Eco-Management and Audit. The analysis of the realized ecological projects proves the effectiveness of the actions for the environment protection undertaken by the described Entrepreneurship.

Key words: entrepreneurships, companies, environment, environment management system

Introduction

The development of entrepreneurships in the 21st century cannot occur without taking care of the natural environment. Undertaking ecological activities, entrepreneurs benefit at the economic, ecological and social levels (Krawczyk, 2012; Adamišin, 2012; Balan and Dragolea, 2013). Therefore, the implementation and popularization of eco-management in companies is so important (Urbaniec, 2009). Certainly, the ecological awareness of the entrepreneurs has been increasing; however, additional systems such as EMAS (*Eco-Management and Audit Scheme*) are not particularly popular.

EMAS had been launched by the European Parliament and Council (EC). It is a system of environment management directed at various organizations, e.g. financial institutions, schools, service providers, production entrepreneurships etc., which voluntarily want to exceed the minimal scope of law provisioned directives, constantly limiting the negative influence of their activity on environment. The participation in the system is optional and open for all the public and non-public organizations (European Parliament and Council Resolution, 2009).

Having discussed in a later part of the article within the Enterprise Water and Sewerage of Czestochowa District, the EMAS system has been running for several years. Every year some establishments and organizations implement the above mentioned system, for example in Poland in 2014 the certificates, confirming a compliance with the highest standards of environmental protection, received four

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new organizations registered in the Eco-Management and Audit Scheme, as follows:

- H & M HENNES & MAURITZ LOGISTICS Sp. z o.o (Ltd.) with Gądek,
- Consortium Oils Recovery Organization with Jedlicze,
- Cementownia "ODRA" SA in Opole,
- REMONDIS Tarnów Mountains Sp. z o.o (Ltd.) of Tarnów Mountains.

Despite many benefits of the introduction of EMAS within companies, organizations, e.g.: a facilitated wider access to external funds, an increased credibility among partners, the increase at the market value of the organization and the economic benefits associated with the relevant waste management, water savings, energy however they are still not popular in our country (Jaźwińska, 2013; Matuszczak-Flejszman, 2011; Lisowska-Mieszkowska, 2007, Pochyluk et al., 2005). Poland is still out of the top ten European countries that have implemented EMAS. The first places are occupied by countries, such as Italy, Spain, Germany (Table 1).

Table 1. Ten countries in terms of the number of organizations that implemented EMAS (at the end of the first quarter of 2013) (Self-study material based on Słonimiec and Świtała, 2013)

Number	Country	The number of organizations
1	Italy	1124
2	Spain	992
3	Germany	861
4	Austria	254
5	Denmark	63
6	Portugal	59
7	Sweden	57
8	Belgium	53
9	Great Britain	51
10	Cyprus	51

The findings suggest that the implementation of an environmental management system in energy-intensive industries has a clear impact on improving the quality of the environment, both in the short and long term (Testa, 2014). Therefore, the most of EMAS scheme is introduced by the industry. It should be noted, however, that this system have recently implemented by the educational institutions. The universities have even undertaken environmental activities, e.g. by conducting research and teaching in the field of environmental protection, the promotion of sustainable development and as institutions seeking to use renewable energy sources or to introduce rules for saving the water, etc. Currently, approx. 50 universities in Europe introduced EMAS. In the first place with Germany because as many as 17 universities were introduced EMAS. In Poland it is only one university - the University of Economics in Poznan - which introduced this system (Disterheft et al., 2012; Adomssent et. al., 2008; Hausen and Lehmann, 2006). The

introduction of EMAS at universities is important to promote the good environmental practices and the expansion of environmental awareness among young people in the future that will be to continue, e.g. by working in different companies.

Characteristics and proecological activity of The Water Supply and Sewerage Joint Stock Company of the Czestochowa District

The Water Supply and Sewerage Company in Czestochowa is a joint stock company owned by The Communes' Municipal Association for Water Supply and Sewerage in Czestochowa. The main activity of the company is the collection and provision of water, as well as waste water collection and treatment.

The activity of the Water Supply and Sewerage Company in Czestochowa consists in the exploitation of: deep-water intakes, water networks with pumping stations and water reservoirs, sanitary sewerage systems with sewage pumping systems and a sewage plant. Using water, nature's greatest treasure, the company undertakes also activities directed at the preservation of water quantitative and qualitative reserves for the future generations.

Environmental policy management aims at the:

- preservation of the reserves of healthy and clean water in appropriate quantity for contemporary and future generations of the Czestochowa region,
- motivation and support of employees in their initiatives for the systematic amelioration of the Company's environmental activity effectiveness,
- provision of open access to information on the Company's impact on the environment to all the interested parties,
- solution of environmental issues via partnership dialogues,
- promotion and popularization of the idea of appropriate water use, raising awareness and expanding knowledge on the pro-environmental behavior and attitude.

The evidence of the Company's ecological responsibility are its implemented systems and documents, e.g. The Environmental Management System and the resolution of the European Parliament and Council no. 1221/2009 on the organizations' voluntary participation in Eco-Management and Audit Scheme in the Community (EMAS). The Environmental Management System has been functioning within the Integrated Management System since 2003. In 2005, also the Eco-Management and Audit Scheme, EMAS, was introduced. The Company was entered into the EMAS National Register in 2008 as the twelfth company in Poland, the first one in the Czestochowa region and the first one in the Polish Sewerage and Water Supply branch. The Company has been developing a coherent strategy for environment protection. The launched system allows for the limitation of the negative influences on environment. The bases of The Environmental Management System are the:

- observance of the legal norms and regulations on the environment protection,

- use of the best available methods and technologies, particularly in the projects involving the greatest impact on the natural environment,
- record of entries allowing for the control and analysis of the environmental activities (PWIK, 2014).

Identification of the Environmental Aspects by the Water Supply and Sewerage Joint Stock Company of the Czestochowa District

The EMAS resolution defines two types of environmental aspects: direct and indirect. Direct environmental aspects comprise activities remaining under the managerial control of the company, whereas the indirect environmental aspects can occur as a result of activities, products and services of the entrepreneurship which, however, cannot be fully managed (Poterek, 2012).

In order to effectively counteract the negative influence on environment, the Company in the Czestochowa District profoundly evaluated all the environmental aspects in particular areas of its activity. The identification of the aspects was done by the Group for the Environmental Aspects Identification and Evaluation created for this particular reason.

Table 2. Direct and Indirect Environmental Aspects (Self-study material based on Environmental Product Declaration of The Water Supply and Sewerage Joint Stock Company of the Czestochowa District , 2014)

Directly important environmental aspects	Indirect environmental aspects
<ul style="list-style-type: none"> - Groundwater intake - Water loss - Organic substances in water waste - Stabilized municipal waste sediments - Water waste exfiltrated from sewage system to the ground - Qualitative and quantitative groundwater reserves protection (GZWP 326 – Main Groundwater Reservoir 326) - Harmful wastes (motor and hydraulic oils) and substances - Electric energy use 	<ul style="list-style-type: none"> - Cleaned wastes disposed by the Sewage Plant WARTA SA (Joint Stock Company) - Industrial wastes containing substances particularly harmful for the aquatic environment, disposed to the sanitary sewage system - Influence on the groundwater quality of the real-estates unconnected to the sewage water systems - Pro-environmental education - Environment influence of the companies providing sewage systems repair and renovation - Environmental effect of the Municipal Entrepreneurship of Czestochowa (Częstochowskie Przedsiębiorstwo Komunalne Sp. z o.o.; Limited Liability Company) - Environmental effect of the SARPI Dąbrowa Górnicza Sp. z o.o., (Limited Liability Company) with the seat in Dąbrowa Górnicza, Poland - Environmental effect of HILKIM Sp. z o.o. (Limited Liability Company) with the seat in Ruda Śląska, Poland

Environmental Effectiveness Ratio

The effects of the company's pro-ecological activities are visible in the ratio values of the environmental effectiveness presented in Table 3.

Table 3. Ratios of Environmental Effectiveness in the company in 2011-2013
(Environmental Product Declaration of The Water Supply and Sewerage Joint Stock Company of the Czestochowa District, 2014)

No.	Ratio	R=A/B (A-initial data/amount of the water taken + amount of sewage taken [m ³])			
		2011	2012	2013	Unit
1	Energetic effectiveness [GJ]	2.90	2.97	2.87	GJ/1000m ³
2	Materials usage effectiveness [kg]	5.09	3.72	3.46	kg/1000m ³
3	Water usage [m ³]	86.20	88.09	84.24	m ³ /1000m ³
4	Mass of generated wastes – total [kg]	279.27	265.66	292.38	kg/1000m ³
	Mass of the generated dangerous wastes [kg]	0.18	0.18	0.13	kg/1000m ³
5	Emission [kgCO ₂]	29.91	31.50	28.61	kgCO ₂ /1000m ³
6	Biological variety [m ²]	31.12	30.82	29.43	m ² /1000m ³

The analysis of the environmental effectiveness ratio values for the company over the past 3 years indicates good results of the undertaken ecological activities. The presented ratios (with the exception of the total wastes mass) became greatly lowered in 2013 as compared to 2011. It indicates the effective activity of the company for the environment protection.

Examples of the completed and new projects within the company's pro-ecological activities

The company has been continuously setting out new tasks in order to obtain the best possible results in the pro-ecological field. In 2013, it managed to complete the following projects:

- Lowering water waste to 915 m³/1 km of the used water network.
- Limiting sewage exfiltration from the water network to the ground and groundwater's due to the renovation of 3087LM of the water network.
- Limiting the discharge of substances particularly harmful for the environment (heavy metals).
- Lowering the odor inconvenience of the sewage purification plant in Ostrowy, Gmina Miedzno, Poland (gmina: Polish administrative unit, commune).

- Educational activities were realized in order to promote aims and actions of such occasions as World Water Day, World Water Week and Worlds Environment Day.
- Maintaining provisioned low use of reagents in the water treatment plant in Blachownia, Poland (less than 7 Mg/year).

Moreover, for the years of 2014-2016, new fields for improvement, and new tasks were listed, e.g. the maintenance in 2014, of the water waste at the level of 915 m³/1km of the used water network, the quality and quantity protection of groundwater reserves, the limitation in 2014 and 2015 of the sewage exfiltration from the water network to the ground and groundwater's thanks to the sewage systems renovation, the limitation of the particularly harmful substances disposal to the sewage water system exploited by the Company, lowering embodied energy processes, water treatment and its supply, reception, sewage treatment and popularization of the rational approach towards the use of natural reserves among the Company's customers (PWIK, 2014).

The entrepreneurship is constantly undertaking educational initiatives, for instance organizing:

- art contests for the primary school children,
- water knowledge competitions: 'Water = Life', for the lower-secondary school students,
- 'Open Doors' for all the interested inhabitants of the region,
- World Water Day and World Water Week celebrations.

There are systematic internal audits and management reviews in the Company. Thanks to these it is possible to determine the effectiveness and efficacy of the environment management system and to indicate potential remedial and preventive actions (Environmental Product Declaration of The Water Supply and Sewerage Joint Stock Company of the Czestochowa District, 2014).

Summary

Entrepreneurships' development in the 21st century must be related to the care of the natural environment. Entrepreneurs' ecological awareness has been increasing, however, despite numerous ecological and economical benefits, relatively low interest in the implementation of additional systems, such as EMAS, has been observed. The Water Supply and Sewerage Joint Stock Company of the Czestochowa District is one of few companies in the field which received the Integrated Management System Certificate. The Certificate gives entitles an entrepreneurship to many benefits, e.g. the economical ones related to appropriate waste management, water and energy saving, credibility, client trust and satisfaction, company's development in symbiosis with the natural environment. The Company undertakes numerous activities aiming at the preservation of quantitative and qualitative water reservoirs for the future generations. The Water Supply and Sewerage Joint Stock Company of the Czestochowa District with its

activity may set an example for other entrepreneurs. It has been confirmed with the Company's nomination by the Directorate-General for the Environment Protection in Warsaw, to the European EMAS Awards in 2010, 2011, 2012 and 2014. The Directorate-General for the Environment (European Commission) awards with the EMAS Award the companies and organizations which particularly skillfully combine innovation and economic stability, with regard to environmental issues, and thus, instill the idea of balanced development.

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FUNKCJONOWANIE SYSTEMU ZARZĄDZANIA ŚRODOWISKOWEGO (EMAS) NA PRZYKŁADZIE PRZEDSIĘBIORSTWA WODOCIĄGÓW I KANALIZACJI OKRĘGU CZĘSTOCHOWSKIEGO

Streszczenie W artykule przedstawiono działania proekologiczne zrealizowane w poprzednich latach oraz planowane na lata 2014-2016 przez Przedsiębiorstwo Wodociągów i Kanalizacji Okręgu Częstochowskiego S.A. Zwrócono uwagę na liczne korzyści płynące z wdrożenia EMAS w przedsiębiorstwach. Przedsiębiorstwo Wodociągów i Kanalizacji Okręgu Częstochowskiego S.A. jest jedną z niewielu firm tej branży, które uzyskały certyfikat Zintegrowanego Systemu Zarządzania. W pracy przedstawiono działania m.in. identyfikację aspektów środowiskowych, obliczenie wskaźnika efektywności środowiskowej podjęte przez przedsiębiorstwo w celu wdrożenia Systemu Ekozarządzania i Audytu. Analiza zrealizowanych zadań ekologicznych świadczy o skutecznych działaniach podejmowanych przez omawiane przedsiębiorstwo na rzecz ochrony środowiska.

Słowa kluczowe: przedsiębiorstwa, środowisko, system zarządzania środowiskowego

环境管理体系(EMAS)例如，供水和污水公司圈子琴斯托霍瓦。

摘要:本文介绍了在实施前几年，并计划在年内由2014年至二零一六年的供水和下水道区琴斯托霍瓦SA的环保措施会议提请注意EMAS在公司的许多好处。水和污水区琴斯托霍瓦SA是为数不多的公司在行业内已认证的集成管理系统之一。本文的行动，除其他外，环境因素，环境绩效指数的计算，以实施生态管理和审核系统通过了公司标识呈现。分析完成任务的有效行动生态的证据采取相关公司对环境的保护。

关键字：公司，环境，环境管理体系